Warsaw University of Life Sciences – SGGW
Institute of Economics and Finance

Proceedings of the 2021
International Scientific Conference

ECONOMIC SCIENCES for AGRIBUSINESS and RURAL ECONOMY

Warsaw, 24 May 2021

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Time schedule of the conference

Preparation of the proceedings and organisation: October 2020 – October 2021
Conference: 24 May 2021

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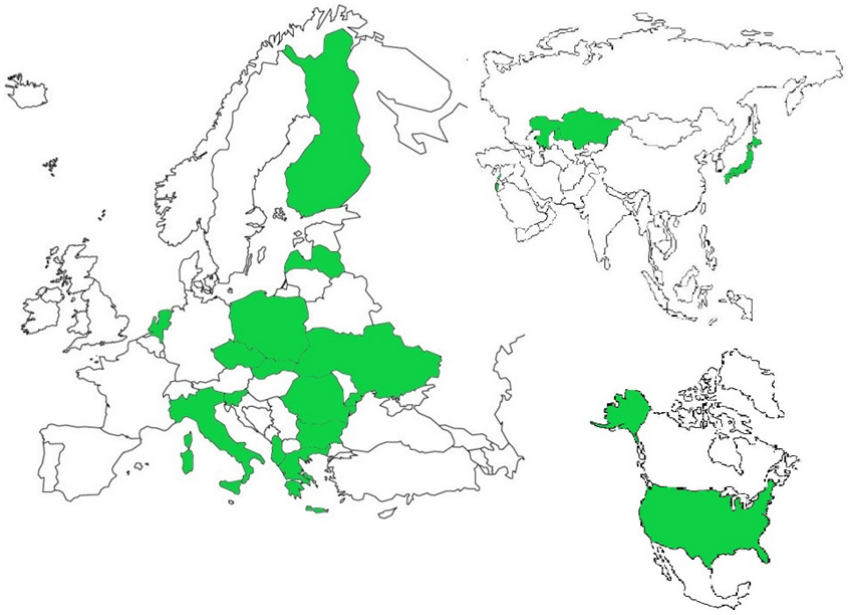

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Publication of Ethics and Malpractice Statement for the International Scientific Conference 'Economic Sciences for Agribusiness and Rural Economy'

While upholding the highest form of ethical correctness, the Editorial Board ensured that the authors included in the publication of the papers, adhered to the ethical standards established by the Programme Committee. Each author was obliged to sign and present an editorial statement on the originality of the paper, and not publish any part or the whole paper before. The statement prepared for the authors required indicating all authors of the submitted paper and confirming their contribution to the study submitted to the editorial staff. In addition, while ensuring the correct use of sources during the preparation of the paper, the authors confirmed the demonstration of all citations used in the paper. The entire publication was planned and prepared in accordance with the highest standards of: the European Charter for Researchers, ensuring compliance with ethical standards over national standards, Polish legislation, ensuring ethical standards for publishing at the national level of the editorial office and the publisher, as well as maintaining the highest ethical standards of the institution represented by the editors of the publication – the Institute of Economics and Finance (formerly: Faculty of Economic Sciences) of the Warsaw University of Life Sciences – SGGW. Under the leadership of the Editor-in-Chief, the entire editorial team, the scientific and organisational committee, as well as reviewers and authors applied the best practices in terms of their duties and ethics. All editorial staff members were introduced to the Code of Conduct and Best Practice Guidelines for Journal Editors of the Committee on Publication Ethics (COPE). In accordance with the COPE Code of Conduct and the Strategic Plan of 2016–2018 promoting integrity in research and its publication, a list of responsibilities and responsibilities were drawn up, necessary to meet the highest standards of ethical behaviour for all parties involved in the act of publication. The Scientific Council and the Editors were responsible for the high level of substantive content, a high rate of internationalisation of publications, implementation of good and better practices in the editorial process and maintaining the highest possible publishing standards.

DUTIES OF EDITORS

Publications decisions

The editorial responsibilities under the direction of the Editor-in-Chief varied depending on the stage of publication. The editors were responsible for maintaining high standards from the point of receiving the articles all the way through to the publication of the study. In mid-2017, the Editor-in-Chief, guided by the '*summum bonum*' of the planned publication, appointed experts with vast scientific and professional experience, as well as achievements in the international field. Thus, the appointed Scientific Council of the publication, consisted of the highest ranking experts for the planned thematic sections of the conference and publication at the same time. The Editors and the Organising Committee were appointed based on the experience of their members, knowledge and acquired skills. A diversity of views was ensured by the appointment of the Editorial Board, consisting of renowned experts from abroad, representing highly-rated scientific institutions. In the decision-making field, it was crucial to appoint reviewers to direct the papers submitted by the authors to the relevant substantive and recognised reviewers. The professionalism of scientists and their unblemished reputation were used as a guideline during the selection process. After obtaining two independent reviews at the discretion of the Editor-in-Chief, the decision on accepting or rejecting the submitted paper remained, however the scale of responsibility for this decision varied depending on the opinions issued by the reviewers. In special cases, the decision of the Editor-in-Chief was addressed to a third, independent review. The editors were responsible for deciding about the need for the author to introduce corrections. The decisions made were comprehensive, considering the fact that 131 papers were sent to the Editorial Office. Since the beginning of work on the publication, editors have been guided by the principles of ethics and responsibilities resulting from current legal requirements regarding such aspects as defamation, copyright infringement and plagiarism.

Fair play

The Editor-in-Chief asked for an assessment of papers based on their substantive content regardless of the origin of the author, the institution represented by them, race, sex, sexual orientation, religious beliefs, ethnicity, citizenship or political philosophy. Total impartiality also concerned the selection of reviewers as well as members of the Scientific Council, the Organising Committee and the Editorial Board. The development of the Fair Play principle can be found below in the Confidentiality section.

Confidentiality

The Editor-in-Chief and every member of the editorial office could not disclose any information about the submitted report to third parties. In order to maintain the highest standard of the Editor's decision, the submitted articles were sent directly to one person from the Editorial Office, which then removed the personal data of the authors before referral for review and further proceedings. Thus, only the Editor-in-Chief and a designated representative for personal data had knowledge of the personal data of the authors. The given report, with the personal data removed, was then submitted to the reviewers appointed by the Council, who possessed no knowledge about the authors of the paper and about each other. The results of the blind, double review were directed to the authors without the disclosure of the personal data of the reviewers.

Disclosure and conflicts of interest

The submitted papers are the intellectual property of the authors and co-authors before, during and after the publication. The members of the Editorial Staff and all persons related to publishing the publications have no right to use them under their own name. In the event of a possible conflict of interest, the Editor-in-chief issued preventive orders to protect and place the good of the author of the paper above others.

DUTIES OF REVIEWERS

After the deletion of personal data of authors and co-authors, each submitted report was referred for a double, blank review. In situations of contradictory reviews, by decision of the editor-in-chief, the paper was sent for a 'super' third review. The editors' policy was to refer the paper to the reviewer from another institution and, if possible, from another city. Referral of the submitted paper to reviewers working in the same unit as the author was forbidden. It was seen as good practice to provide one reviewer for each paper, from a country other than that of the author's. In situations of the third 'super' review, it was the decision of the Editor-in-Chief that the final choice be made by outright experts in a given field, often awarded with an honorary doctorate.

Contribution to editorial decisions

The Editor-in-Chief made decisions about the acceptance or rejection of a paper on the basis of two professional, blind reviews. In some cases the authors also recommended that the paper should be corrected, with the aim of protecting the best interests of the authors of individual papers as well as the good of the entire publication.

Promptness

A professional computer system, the 'Online Journal System' was set up by the Editor-in-Chief prior to the planned work on the publication. This enabled each reviewer selected by the Editor to be granted a request for a review and receive information about the date of acceptance or rejection of the review, as well as a date for its completion. If it was impossible to complete the review within the time frame of the deadline set by the Editorial Board, the request was rejected and the decision required justification. The designated reviewer had 5 days to agree to the review and then 14 days for its implementation. In the case of a reviewer's request for an extension to the deadline, the Editor-in-Chief, taking into consideration the good of the author, decided to extend the deadline for the review to up to 21 days.

Confidentiality

The reviewers were informed of the necessity to maintain confidentiality in the reviewing process and all dissemination of information about the report was forbidden. The reviewer could not show or consult the paper with anyone other than the Editor-in-Chief or the person indicated by him.

Standards of objectivity

Each paper was subject to an unbiased and objective review. No personal criticism of the reviewer was allowed. Every opinion, either positive or negative, had to be supported by arguments concerning the content of the paper. In the case of an unsatisfactory justification, the reviewer was requested to elaborate upon his comments so as to prevent any reservations of the Editor with regard the content and opinion of the review.

Acknowledgement of sources

In the interests of the highest good of science and its creators, reviewers were required to identify situations in which parts of the paper were taken from other sources without this being mentioned by the authors. Any use of the work of other authors should be accompanied by appropriate quotations, which the authors were informed about when completing the statement prepared by the Editorial Board. The reviewer was obliged to draw the Editor's attention to significant similarity between the discussed paper and any other document or publication. It was seen as good practice to use the 'random' function in the database to draw a paper in a unbiased way, that would then be checked by the anti-plagiarism system.

Disclosure and conflict of interest

Each reviewer was obliged to immediately report any cases where the review could be related to the work of the reviewer, or give competitive advantage in any way associated with the reviewer or their work.

DUTIES OF AUTHORS

Reporting standards

All authors and co-authors were required to present original contents, not previously published in fragments or in their entirety. In the case of work based on own research, they were required to present in their research in detail, its time and place, justification for its implementation, and any successes and failures. In the case of a paper based on secondary research, all authors and co-authors were required to provide as detailed information as possible about the origin of the data, their availability and use. All work was required to be presented in detail, in a way that would allow other scientists to use it for the purposes of their future research. All dishonest practices were forbidden and it was part of the Editors' and reviewers' responsibility to identify and remove them with the consequences. In projects whose author was a participant and the paper was completed due to the researcher's participation in it, they were obliged to present information about the project in the section of the paper dedicated for such a purpose.

Data access and retention

All authors who based their papers on their own research are required to store a database of such data for a period of at least 5 years from the date of publication of the paper. It is a good practice for the authors to make the database available for research and educational purposes at the request of governmental and non-governmental institutions.

Originality and plagiarism

The authors and co-authors attested the originality of their works in consideration of the protection of intellectual property, good name of science and editorial policy. The statement of originality of the paper, the quotation and presentation of any sources used in the creation of the work were provided in the bibliography together with the content of the paper and sent to the Editor. In addition, papers were selected in a random manner using the 'random' function and checked by a special anti-plagiarism program. Every effort was made to verify the presence of sources for citations and their correctness.

Multiple, redundant or concurrent publication

By submitting a paper to the Editorial Board of the conference 'Economic Sciences for Agribusiness and Rural Economy', the author and co-authors have stated that they have not published, and are not in the process of intending to send the same paper or any part of it to any other editorial office. Publication of a paper based on the same data is considered unethical by the editorial office and is unacceptable.

Acknowledgement of sources

The authors, by drawing on other publications and sources in their papers, were obliged to display their utmost diligence in ensuring the correct quotation of the works that they used to create their own papers. The use of various sources to create own work is the basis for the development of the world of science, which is why the entire editorial team has made every effort to prevent unethical behaviour. A specially prepared review sheet was used containing detailed questions about the correctness of citations and bibliography. Thus, all reviewers were obliged to do their utmost to verify all sources on this basis.

Authorship of the paper

The author who sent the paper was obliged to present all the people who contributed to the creation of the work and list them as co-authors. All co-authors had to sign a statement attached to the paper. The statement contained information about the requirement to list all those who significantly contributed to the creation of the paper and agreed to send it to our editorial staff. It was perceived as good editorial practice to send the collected reviews to both the authors and co-authors.

Hazards and human or animal subjects

In cases when research involved the use of chemical compounds, behaviours or equipment associated with a possible threat to the health or life of animals or people, the author was obliged to clearly identify this threat in the paper.

Disclosure and conflicts of interest

Financial support for creating a paper resulting from cooperation with or membership of a project group should be demonstrated in a specially prepared section of the paper. Regardless of any conflict of interest, the authors preparing the papers were obliged to present the full truth to prevent the spread of unethical behaviour in the world of science.

Fundamental errors in published works

In the case of finding any error, every author and co-author of the submitted and published paper is obliged to immediately contact the Editor-in-Chief in order to withdraw the publication and correct it. Editors also give third parties the right to report errors or any ambiguities in the published publication. Any information about a possible error has always been, is and will be considered with respect to the good of science.

Editor-in-Chief *Mariusz Hamulczuk*

Foreword

Dear Readers,

The fourth International Scientific Conference 'Economy Sciences for Agribusiness and Rural Economy' (ESARE) organised by the Institute of Economics and Finance of Warsaw University of Life Sciences – SGGW took place on 24 May 2021. An integral part of the conference was a workshop for young scientists – students and participants of doctoral studies. Due to the pandemic situation, the conference was held in an online form.

Despite these restrictions, over 160 domestic and foreign participants took part in both events. During the conference, 68 papers were delivered, 40% of which were by participants from foreign institutions. At this point, on behalf of the conference organisers, I would like to warmly thank all the scientists and practitioners who took the time to deliver the presentation and send the manuscripts. I would like also to express my special thanks to the entire Scientific and Organising Committee of the conference.

The main topic of the fourth edition of the ESARE conference was **the implications of the crises for the agri-food sector and rural areas**. Detailed topics included among the other following aspects: micro- and macroeconomic conditions for the development of agri-food economy; finance and insurance in agri-food sector; logistics and supply chains; local and regional development; sectorial and international policies; or new challenges related to bio-economy and climate change.

During the conference, two plenary sessions were held, devoted to '**Crisis implications for sustainable agriculture**' and to '**Changes in the socio-economic conditions of the sector**'. Additionally, nine thematic sessions were organised. Numerous interesting presentations were delivered on various aspects of the functioning of the agri-food sector and rural areas, which constituted the basis for lively scientific discussions. We hope that the conference will be an inspirational framework for all of the participants and contribute to their further development and will contribute to the development of research in the field of agricultural economics.

Ending up, I would like to invite all of you to the next fifth conference which will be held on 9–10 May 2022, and it will be devoted to the European Green Deal and its challenges for the agribusiness sector and rural areas. I would also like to point out that in **2023** our Institute will be celebrating its 70th anniversary. One of the events accompanying these celebrations will be a special edition of our conference '**Economic Sciences for Agribusiness and Rural Areas**' to which I cordially invite you.

On behalf of the Editorial Board
Mariusz Hamulczuk

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CERTIFICATION OF HIGH-QUALITY FOOD PRODUCTS IN THE PERCEPTION OF STUDENTS

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ABSTRACT

This study aimed to investigate the perception of high-quality food products by young consumers, their recognition of logos assigned to registered products, and their experience in purchasing this type of product. The study involved desk research, computer-assisted web interviews (CAWI), and observation. The results of the survey conducted on a sample of 329 students of Warsaw University of Life Sciences (SGGW) showed that the respondents' recognition of high-quality food products was low. More than half of the respondents declared that they do not pay attention to labels when shopping for food, while those who buy certified food products indicated the following reasons: curiosity, promotion, or loyalty to a specific product. Almost one in four respondents declared that they do not buy imitations of original products covered by the registration.

Key words: food products, high quality, certification
JEL codes: E2, R22, Q18

INTRODUCTION

The intensification of agricultural production, the development of food processing, transport, and, on the other hand, the changing expectations and tastes of consumers make certification schemes guaranteeing a certain level of quality of food products more and more needed. Particularly valuable are quality schemes promoting regional, original and traditional production processes and ensuring the international recognition of the product. Support for traditional food production and processing is provided at the national level to promote and add prestige to quality foodstuffs as well as at the EU level (Gulbicka, 2014). The most important issue is the demand for high-quality food products and the level of consumer knowledge about them. The research presented in this article is devoted to this issue.

The presented research aims to investigate the perception of high-quality food products by young consumers, their recognition of the logos assigned to these products, and their experience in purchasing this type of product. The choices of young consumers regarding high-quality food products are dictated by the still insufficiently recognised motives and behaviour patterns of this cohort. With this in mind, this paper seeks to address the following research questions:

1. What is the level of awareness of the logos assigned to Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), or Traditional Specialty Guaranteed (TSG)?

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2. To what extent are the respondents interested in purchasing products covered by registration?
3. What is the respondents' attitude to products imitating products covered by registration?

THEORETICAL BACKGROUND

High-quality food products are of interest to many authors, including Krasowska and Salejda (2011), Ozimek and Tomaszewska (2011), Gheorghe, Nistoreanu and Filip (2013), Bienia et al. (2016), Goryńska-Goldmann and Gazdecki (2017), Grębowiec (2017), Szlachciuk et al. (2017), Borowska (2018), Oleksiuk and Werenowska (2019), Hełdak et al. (2020).

The schemes ensuring the protection of the quality of agricultural products and foodstuffs introduced at the European Union level grant certificates confirming the original and traditional character of selected products. The initiators of such form of protection were the French, who already in the 1930s introduced the protection of wines obtained by traditional production methods. Such protection involves granting one of the three certificates: Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), or Traditional Specialty Guaranteed (TSG). The most restrictive requirements must be met by the product applying for a PDO, as all production stages must take place in the region indicated in the specification The least restrictive criteria must be met by products applying for a GTS, as here, the production can take place throughout the country, provided that its composition and method of production complies with the specification. Product protection also covers its name, which is beneficial for consumers. The register of regional and traditional products kept by the Ministry of Agriculture and Rural Development lists 44 products, including 10 under the PDO category, 24 – PGI, and 10 – GTS[1]. According to Council Regulation (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs (Article13(1)), registered names shall be protected against:

a) any direct or indirect commercial use of a registered name in respect of products not covered by the registration in so far as those products are comparable to the products registered under that name or in so far as using the name exploits the reputation of the protected name;
b) any misuse, imitation, or evocation, even if the true origin of the product is indicated or if the protected name is translated or accompanied by an expression such as 'style', 'type', 'method', 'as produced in', 'imitation' or similar;
c) any other false or misleading indication as to the provenance, origin, nature or essential qualities of the product, on the inner or outer packaging, advertising material or documents relating to the product concerned, and the packing of the product in a container liable to convey a false impression as to its origin;
d) any other practice liable to mislead the consumer as to the true origin of the product.

These regulations are potentially beneficial for both the producers and consumers. Unfortunately, the observation of the market, including the online shopping sites, shows that the names assigned to products covered by EU certification are used by other manufacturers and traders to name products not covered by the registration. There are also situations where the name of the product does not infringe the law but contains a reference to a certified product. Examples are provided in Table 1.

[1] PDO: *bryndza podhalańska*, *oscypek*, *redykołka*, *wiśnia nadwiślańska*, *podkarpacki miód spadziowy*, *karp zatorskim*, *fasola Piękny Jaś z doliny Dunajca*, *fasola wrzawska, miód z Sejneńszczyzny/Łoździejszczyzny*, *miód spadziowy z Beskidu Wyspowego*; PGI: *miód wrzosowy z Borów Dolnośląskich*, *obwarzanek krakowski*, *rogal świętomarciński*, *śliwka szydłowska*, *wielkopolski ser smażony*, *jabłka łąckie*, *andruty kaliskie*, *chleb prądnicki*, *truskawka kaszubska*, *miód drahimski*, *fasola korczyńska*, *kołacz/kołocz śląski*, *miód kurpiowski*, *jabłka grójeckie*, *suska sechlońska*, *ser koryciński swojski*, *kiełbasa lisiecka*, *jagnięcina podhalańska*, *krupnioki śląskie*, *cebularz lubelski*, *kiełbasa biała parzona wielkopolska*, *kiełbasa piaszczańska*, *czosnek galicyjski*, *podpiwek kujawski*; GTS: *półtorak staropolski tradycyjny*, *dwójniak staropolski tradycyjny*, *trójniak staropolski tradycyjny*, *czwórniak staropolski tradycyjny*, *olej rydzowy tradycyjny*, *pierekaczewnik*, *kiełbasa jałowcowa staropolska*, *kiełbasa myśliwska staropolska*, *kabanosy staropolskie*, *kiełbasa krakowska sucha staropolska* (Ministerstwo Rolnictwa i Rozwoju Wsi, 2020).

Table 1. Selected imitations of high-quality products covered by the registration

Protected Designation of Origin		Protected Geographical Indication	
Registered product name	Imitation	Registered product name	Imitation
bryndza podhalańska[a]	*bryndza owcza / / ser typu bryndza*[a]	*miód wrzosowy z Borów Dolnośląskich*[b]	*miód wrzosowy z wrzosów leśnych borów*[b]
oscypek[a]	*scypek / serek typu oscypek*[a]	*rogal świętomarciński*[c]	*rogal Świętego Marcina / / rogal marciński*[c]
redykołka[a]	*serek góralski typu redykołka*[a]	*wielkopolski ser smażony*[a]	*smażony ser typu wielkopolskiego / smażony ser a'la wielkopolski*[a]
podkarpacki miód spadziowy[b]	*miód ze spadzi iglastej z Podkarpacia*[b]	*andruty kaliskie*[c]	*wafle typu andruty kaliskie*[c]
Traditional Specialty Guaranteed		*obwarzanek krakowski*[c]	*precel z krakowska, bajgiel z Krakowa*[c]
Registered Product Name	Imitation	*ser koryciński swojski*[a]	*ser dojrzewający podpuszczkowy typu koryciński/ ser a'la koryciński*[a]
trójniak staropolski tradycyjny[b]	*miód benedyktyński trójniak korzenny*[b]	*kiełbasa lisiecki*[e]	*tradycyjna kiełbasa typu lisiecka*[e]
olej rydzowy tradycyjny[d]	*olej z lnianki*[d]	*kołacz / kołocz śląski*[c]	*ciasto drożdżowe typu kołacz*[c]
kiełbasa krakowska sucha staropolska[e]	*kiełbasa krakowska podsuszana swojska*[e]	–	–

A – kind of cheese; B – kind of honey; C – kind of baking; D – kind of oil; E – kind of sausage.

Source: own observations of the following online auction and shopping sites: allegro.pl, olx.pl, marketplace-facebook.com [accessed 08–12.04.2021].

Most often, the analysed online platforms showed offers for the sale of products referring to the name of *ser koryciński swojski* (cheese), *rogal świętomarciński* (crescent roll), and *wielkopolski ser smażony* (fried cheese).

RESEARCH METHODOLOGY

The study involved the analysis of source materials and the computer-assisted web interview (CAWI) method. The survey questionnaire was prepared on the Google platform. It contained closed, semi-open, and alternative questions. The supporting technique was the observation carried out on online auction and shopping sites to determine whether the registered products are being counterfeited.

The survey was made available to students of Warsaw University of Life Sciences (SGGW) on the Teams platform from 1 March to 20 March 2021. Three hundred and twenty nine students took part in the survey. All questionnaires were correctly completed.

RESEARCH RESULTS AND DISCUSSION

As regards the respondent's characteristics, women constituted 59.2% of the sample. As for the place of residence, 44.3% of the respondents declared that they lived in cities with a population of more than 200 000; 24.8% – in rural areas, 19.6% – in cities up to 50 000 inhabitants, and 11.3% – in cities with population from 50 000 to 200 000. Considering the research questions, it was relevant for this study to ask the respondents to estimate the cost of groceries per person per week. More than a half (57.5%) indicated that it was from 100 to 200 PLN, 30.8% – up to 100 PLN, and 11.7 over 200 PLN.

The term 'high-quality food products' was associated by the respondents primarily with those that are consistently checked by a reliable control institution and are organic (Table 2). These results are consistent with the results of the research presented by Bienia et al. which show that the main associations included healthy food (65%) and traditional production

methods (43.5%) (Bienia, Sawicka and Krochmal-Marczak, 2016).

The recognition of visual identifiers (logos were included in the questionnaire) assigned to the products granted PDO, PGI, or TSG certificates was also verified (Table 3). This data compilation also takes into account the leading differentiating variables, i.e. age, place of residence, and the declared cost of groceries per person per week.

The differentiation in the recognition of individual logos at the level of the entire sample was insignificant. Some differentiation was noticed about gender, women less frequently than men declared the recognition of the PGI and the TSG logos. The

Table 2. Associations of the respondents with the term 'high-quality food products', $N = 329$ (%)

Specification	Value
Available from delicatessen rather than discounters	5.78
Only available at food fairs and fests	9.42
Available directly from a farmer	22.19
Registered with the Ministry responsible for agriculture	27.36
With a short shelf life	29.79
The product is made according to a traditional recipe	43.16
Organic product	61.70
Checked each time by a reliable control institution	67.17

Note: The respondents could indicate more than one answer.

Source: own empirical research.

Table 3. Recognition of logos of registered high-quality food products by selected variables (%)

Variable		Logo	Recognition		
			yes	no	not sure
Total, $N = 329$		PDO	41.6	43.8	14.6
		PGI	43.5	41.6	14.9
		TSG	40.7	39.8	19.5
Gender	women, $N = 193$	PDO	41.5	43.0	15.5
		PGI	41.5	43.5	15.0
		TSG	39.4	40.4	20.2
	men, $N = 136$	PDO	41.9	44.9	13.2
		PGI	46.3	39.0	14.7
		TSG	42.6	39.0	18.4
Place of residence	rural areas, $N = 81$	PDO	35.8	48.1	16.0
		PGI	39.5	44.4	16.0
		TSG	38.3	44.4	17.3
	cities under 200 000 inhabitants, $N = 101$	PDO	43.6	41.6	14.9
		PGI	44.6	42.6	12.9
		TSG	42.6	34.7	22.8
	cities over 200,000 inhabitants, $N = 147$	PDO	43.5	42.9	13.6
		PGI	44.9	39.5	15.6
		TSG	40.8	40.8	18.4
Cost of groceries per person per week	< 100 PLN, $N = 100$	PDO	35.0	48.0	17.0
		PGI	41.0	44.0	15.0
		TSG	29.0	47.0	24.0
	100–200 PLN, $N = 187$	PDO	40.6	46.0	13.4
		PGI	42.2	42.2	15.5
		TSG	43.9	38.0	18.2
	> 200 PLN, $N = 42$	PDO	61.9	23.8	14.3
		PGI	54.8	33.3	11.9
		TSG	54.8	31.0	14.3

Source: own empirical research.

share of people familiar with these logos was lower among rural residents than among urban residents. As for the declared cost of groceries, the logo recognition was the highest among respondents declaring expenses over 200 PLN per person per week. The respondents were also asked to list the products granted any of the analysed logos with which they were familiar. The most frequently mentioned included: *oscypek* (sheep milk cheese made in Tatra Mountains) (44 people), several people mentioned *jabłka grójeckie* (apples) (6), *rogal świętomarciński* (crescent roll) (5), *cebularz lubelski* (onion flatbread) (4), *truskawka kaszubska* (strawberry) (2), *ser koryciński* (cheese) (2). Seven of the respondents mentioned products that were not registered.

The study also aimed to determine how frequently the respondents purchased the certified products (Table 4).

Among the respondents declaring buying certified food products, a relatively large proportion declared purchase out of curiosity. This reason was also indicated by Gheorghe et al. (2013), Oleksiuk and Werenowska (2019), and Hełdak et al. (2020). In turn, the research of Goryńska-Goldmann and Gazdecki (2017) shows that the main reason was the belief in the pro-health value of this type of food.

More than half of the respondents indicated that they do not pay attention to the labels. This result is consistent with the study of Borowska (2008) who also emphasized little recognition of the logos in question. The share of consumers not reading labels was the highest in the case of rural residents and people declaring the lowest level of food expenditure. Also, the research of Szlachciuk et al. (2017) carried out among young people shows that almost every fifth respondent admitted that they did not look for information about regional and traditional food products, including products granted the EU certification in question.

Every fifth resident of a large city indicated that they buy this type of product from time to time and it was declared more often by men than women (Table 4). The respondents' attachment to the products was rather low. Only about 6% indicated that they have a few favourites that they sometimes buy and one favourite was selected by 0.6% of people. When asked to list their favourite certified food products, the respondents most often mentioned

Table 4. The frequency of purchase of registered high-quality food products by selected variables (%)

Specification		Frequency							
		A	B	C	D	E	F	G	H
Total, *N* = 329		54.4	15.9	9.5	8.6	6.1	2.1	1.8	0.6
Gender	women, *N* = 193	56.0	13.0	10.9	9.3	5.2	3.1	1.6	1.0
	men, *N* = 136	52.9	19.9	8.1	7.4	7.4	0.7	0.7	0.0
Place of residence	rural areas, *N* = 81	61.7	16.0	9.9	6.2	3.7	2.5	0.0	0.0
	city < 200 000, *N* = 101	50.5	15.8	8.9	11.9	7.9	1.0	2.0	2.0
	city > 200 000, *N* = 147	53.7	15.6	10.2	7.5	6.1	2.7	1.4	0.0
Cost of groceries per person per week	<100 PLN, *N* = 100	64.0	10.0	8.0	5.0	7.0	4.0	0.0	2.0
	100–200 PLN, *N* = 187	53.5	17.6	9.6	9.6	4.8	1.6	2.1	0.0
	> 200 PLN, *N* = 42	38.1	21.4	14.3	11.9	9.5	0.0	0.0	0.0

A – I don't pay attention to labels; B – From time to time, out of curiosity; C – I have never had a chance to find such a product; D – From time to time there is a promotion; E – I have a few favourites that I sometimes buy; F – Never because they are quite expensive; G – Often, I often look for such logos when I buy groceries; H – I have one favourite product that I sometimes buy.

Source: own empirical research.

oscypek (sheep milk cheese made in the Tatra Mountains) – 19 people. Individuals mentioned *jabłka grójeckie* (apples), *redykołka* (miniature sheep milk cheese made in Tatra Mountains) and *ser koryciński* (cheese).

In the authors' research, the majority of respondents do not pay attention to food products' labels. Meanwhile, the research by Ozimek and Tomaszewska (2011) shows that in the hierarchy of importance of information sources about food products, the packaging on which labels are placed was in the first position. This is also confirmed by the research of Krasowska and Salejda (2011). The low frequency of purchasing traditional products was also indicated by Grębowiec (2017).

As there are frequent situations where registered products' names are used by producers of food to name products not covered by the relevant registration, the respondents' attitude to this type of practice was verified (Table 5).

Every fourth respondent admitted that they buy such products despite having doubts as to whether it was a fair practice (Table 5). They were mostly women, inhabitants of rural areas, and people who spent no more than 100 PLN a week on groceries.

CONCLUSIONS

The study showed that the respondents' recognition of high-quality food products was low, which is consistent with the studies of other authors. In the open question, the respondents most often mentioned the most popular traditional food products, also available in supermarkets (*oscypek*, *jabłka grójeckie*, *rogal świętomarciński*), the recognition of the logos assigned to registered products was quite low, although slightly differentiated depending on gender and place of residence.

More than half of the respondents declared that they do not pay attention to labels when they purchase food products. Only a few respondents declared frequent purchases of products with the logos in question, and every third – sporadic purchase, dictated by curiosity, promotion, or having a favourite, occasionally purchased product. Almost every fourth respondent indicated that they do not buy products that are imitating certified products, and this was declared mainly by people with the highest weekly expenditure on groceries person.

The limitation of this study is the lack of representativeness of the research sample. However, the

Table 5. Respondents' attitude to imitations of registered high-quality food products by selected variables (%)

Specification		Attitude to imitations of certified products				
		A	B	C	D	E
Total		33.6	11.7	25.6	4.6	23.5
Gender	women	29.5	11.9	28.0	4.7	23.3
	men	38.2	11.0	21.3	4.4	22.8
Place of residence	rural areas	33.3	11.1	28.4	3.7	22.2
	city < 200 000	32.7	11.9	27.7	3.0	23.8
	city > 200 000	33.3	11.6	21.8	6.1	23.1
Cost of groceries per person per week	< 100	39.0	9.0	26.0	3.0	20.0
	100–200 PLN	31.0	13.9	25.7	4.3	23.0
	> 200 PLN	28.6	7.1	21.4	9.5	31.0

A – I have no opinion; B – I think it is a good idea (it allows me to imagine how this cheese can taste); C – I buy imitations, but I have doubts if it is a fair practice; D – I buy imitations, but I know it is against the law; E – I don't buy imitations because I know it's an example of unfair practice.

Source: own empirical research.

presented research results and the quoted literature might suggest that there is a need to strengthen the communication of this type of product to young consumers.

The research allowed for the formulation of the following theoretical and practical implications: (1) In research on the consumption of high-quality food products, both quantitative and qualitative methods should be taken into account at the same time; (2) The Government and industry institutions should be more involved in the promotion and protection of PDO, PGI or TSG certified products.

REFERENCES

1. Bienia, B., Sawicka, B., Krochmal-Marczak, B. (2016). Żywność regionalna i tradycyjna w opinii mieszkańców powiatu krośnieńskiego. In: K. Melski, D. Walkowiak-Tomczak (Eds) Żywność dla świadomego konsumenta. Wydział Nauk o Żywności i Żywieniu Uniwersytetu Przyrodniczego w Poznaniu, Poznań, pp. 94-103.
2. Borowska, A. (2008). Attitudes of European Consumers to Traditional and Regional Products. Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie, Ekonomika i Organizacja Gospodarki Żywnościowej, 72, pp. 145-159.
3. Borowska, A. (2018). Opportunities and barriers regarding the development of regional bean production with geographical certification in Poland. Economic Sciences for Agribusiness and Rural Economy, 1, pp. 133-139.
4. Council Regulation (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs. OJ L 93/12, 31.03.2006.
5. Gheorghe, G., Nistoreanu, B.G., Filip, A. (2013). Traditional products – vectors of sustainable development on the regional and national markets. Business and Sustainable Development, 15 (7), pp. 645-358.
6. Goryńska-Goldmann, E., Gazdecki, M. (2017). Buying factors as an innovation platform on regional and traditional products market. Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu, 13 (6), pp. 35-41.
7. Grębowiec, M. (2017). Regional and Traditional Products as an Element of Building a Competitive Food Product Offer in Poland and Other European Countries. Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie, Problemy Rolnictwa Światowego, 17 (2), pp. 65-80.
8. Gulbicka, B. (2014). Żywność tradycyjna i regionalna w Polsce. Konkurencyjność polskiej gospodarki żywnościowej w warunkach globalizacji i integracji europejskiej. Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej – Państwowy Instytut Badawczy, Warszawa.
9. Hełdak, M., Konako, S.S.K., Kurtyka-Marcak, I., Raszka, B., Kurdo, B.C. (2020). Visitors' Perceptions towards Traditional and Regional Products in Trabzon (Turkey) and Podhale (Poland). Sustainability, 12, 2362. https://doi.org/10.3390/su12062362
10. Krasnowska, G., Salejda, A.M. (2011). Ocena wiedzy konsumentów na temat znakowania żywności. Żywność. Nauka. Technologia. Jakość, 1 (74), pp. 173-189.
11. Ministerstwo Rolnictwa i Rozwoju Wsi (2020). Produkty zarejestrowane jako Chronione Nazwy Pochodzenia, Chronione Oznaczenia Geograficzne oraz Gwarantowane Tradycyjne Specjalności. Retrieved from: https://www.gov.pl/web/rolnictwo/produkty-zarejestrowane-jako-chronione-nazwy-pochodzenia-chronione-oznaczenia-geograficzne-oraz-gwarantowane-tradycyjne-specjalnosci [accessed 29.03.2021].
12. Oleksiuk, I., Werenowska, A. (2019). Promotion of regional and traditional products. Środkowoeuropejskie Studia Polityczne, 2, pp. 135-149.
13. Ozimek, I., Tomaszewska, M. (2011). Znaczenie wybranych źródeł informacji o produktach żywnościowych dla konsumentów. Handel Wewnętrzny, 2, pp. 48-56.
14. Szlachciuk, J., Bobola, A., Ozimek, I., Czyż, E. (2017). Znajomość polskich produktów regionalnych i tradycyjnych wśród młodych konsumentów. Ekonomiczne Problemy Turystyki, 3 (39), pp. 77-88.

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EVALUATING THE IMPACT OF TAX POLICY ON THE ASSETS OF AGRICULTURAL ENTERPRISE

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ABSTRACT

Every taxpayer is obliged to pay tax on their profits, but if taxpayers feel that the government is opaque and ineffective with their taxes, their willingness to pay taxes is reduced. At the same time, the higher the tax rate for tax subjects, the lower their interest in paying taxes. The optimal tax burden should be a burden that encourages people to work and stimulate businesses to create value. Each state seeks to maximize tax revenues as part of its tax policy, while at the same time ensuring that the tax system does not interfere with the economy or negatively affect the business environment. The state strives to maintain the most optimal state tax system and to support the market economy and competitiveness. Therefore, the state must have a tax administration that can collect taxes efficiently, and consequently, the tax system in the state should be such that the redistribution of collected taxes will be as efficient and fair as possible. The main goal of the article is to examine the dependence of tax policy on the agricultural business economy and find an effective variant of enterprise income taxation, which should have a positive impact on the business activity and competitiveness of companies in the selected sector of the economy and such taxation still would be beneficial for the state. The article will also set out some hypotheses based on the gained theoretical knowledge, as well as on the set research question.

Key words: agricultural enterprise, tax, tax burden, tax implications, tax policy
JEL codes: H20, H25, Q13, C19

THEORETICAL BACKGROUND

The current period can be characterized as a period of significant globalization of individual markets and economies. This globalization is inevitably reflected in individual tax systems, and such tax systems of individual states may compete or converge with each other. Tax competition occurs mainly indirect taxes, especially in the area of taxation of company profits, income from financial capital, etc. (Kovács, 2016). Governments often seek to reduce the tax burden on direct taxes, thereby seeking to support the business activity of taxable persons. Direct taxes can be used more often as a regulatory tool to make better use of various social savings, because on the one hand, they create tax justice, but on the other hand, they reduce

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the savings of taxable persons, as they pay part of their income in the form of taxes (Vančurová and Láchová, 2018).

The tax burden represents the degree of the burden imposed by the relevant tax legislation on individual tax subjects. This tax burden has a relatively large impact on the tax entities because they must pay individual taxes to the public budgets from the relevant tax base. The size of the tax burden itself affects the business activity of tax entities, and it can be stated that the lower the tax burden, the higher the activity of business entities (Harumová and Kubátová, 2006). In the EU agricultural taxation systems income from agricultural activities is subject to taxation. Due to the specificity of agriculture, there are constructions often used to reduce the tax burden borne by farmers (Gruziel and Raczkowska, 2018). The optimal tax burden should encourage businesses to create value (Nemec and Burák, 2016). A well-defined tax policy is very important, as the reasons for the failure of companies in certain market environments can be not only internal factors, such as insufficient market position or higher material costs but also external factors, which can include a high tax burden or non-competitive tax burden compared to other countries (Bielik and Turčeková, 2013).

The European Union is convinced that, although the individual Member States of the European Union decide on their taxes independently, thanks to its measures, these countries can achieve better results in this area. At the same time, European Union regulations aim to ensure that the Member States increase their competitiveness and that they are unable to worsen their position in international competition through their tax policies (Trautmann, 2014). The EU systems have taxes on holding wealth or part of it (on properties, agriculture) and on increase in property (Gruziel and Raczkowska, 2018). The harmonization of taxes within the European Union itself is also based on the fact that the individual countries of the European Union lose about EUR 50 billion each year due to tax fraud. Most of this amount is mainly related to cross-border VAT fraud, and therefore in 2016, the European Commission adopted a VAT Action Plan, which represented a reform of the VAT system so that the system was as administratively simplified as much as possible, using information and technological conveniences and eliminating inconsistencies in the individual tax systems of individual countries of the European Union relating to VAT (European Commission, 2015).

The European Union is currently seeking this coordination to gradually achieve harmonization not only of individual taxes but also, in the future, harmonization of tax rates. Coordination and harmonization themselves represent an approximation of laws, within the framework of which the legislation of individual countries is harmonized with the legislation and code of ethics of the European Union (Ficbauer and Ficbauer, 2012; Terra and Wattel, 2012). The governments of the countries try to define their tax policy in such a way that tax policy creates barriers as little as possible, which would have an impact on the economy and business environment. For this reason, tax policy should be as clear and efficient as possible, since only such a tax policy can provide sufficient resources for individual government budgets.

MATERIALS AND METHODS

Based on the acquired theoretical knowledge of the researched problem, we identified the research question: 'What effect does the size (assets) of the company have on the economy of the enterprise depending on the volume of income taxes levied within the selected agricultural sector?'. At the same time, hypotheses were determined based on the obtained theoretical knowledge, as well as on the established research question. These are the following hypotheses:

- H1: 'An increase in the non-taxable part of the tax base will have a positive impact on the business economy in the selected agricultural sector of the national economy'.
- H2: 'The reduction of the tax rate for enterprises with a turnover of up to 100 000 EUR per year will support the innovative potential of small businesses within the selected agricultural sector'.

Answers to the mentioned hypotheses and research questions can be obtained based on the analysis and evaluation of individual data, which will form a set of input data. The individual enterprises have been

studied and analysed by the statistical classification of economic activities SK NACE 2. These are enterprises in the agricultural sector, and no distinction will be made between the territorial scope of individual enterprises. The quantitative survey was conducted in the form of a questionnaire survey on a selected sample of respondents. This sample of respondents included more than 400 small and medium-sized enterprises, which exceeded the minimum established sample within 6 450 objects of research (Buliková, Bielik and Belinska, 2021).

To determine the sample size, we use a formula to determine the minimum sample size:

$$n \geq \frac{\left(z^2 \cdot p \cdot q\right)}{\Delta^2}, \quad (1)$$

where:
n – minimum sample size,
p, q – percentage of objects that can be inclined to one or the other variant,
z – reliability coefficient of the given statement,
Δ – maximum permissible error.

The questions in the questionnaire were scored statistically by a percentage score based on the number of responses to the suggested answer options. Some questions were assessed on a rating scale, where possible answers were assigned points from 1 to 5, and then the arithmetic mean was calculated, and based on the obtained value, the answer to the question was estimated.

Regression analysis examines the relationships between two or more variables. In linear regression, the expected value of a dependent variable is given by a linear combination of estimated coefficients and values of independent variables, which can be written as:

$$Y_i = \beta_0 + \beta_k X_i + \varepsilon_i, \quad (2)$$

where:
Y_i – dependent variable,
β_0 – locating constant,
β_k – regression coefficients,
X_i – independent (explanatory) variable,
ε_i – error term.

RESEARCH RESULTS AND DISCUSSION

Based on the analysis of selected business entities, which formed the examined sample in terms of assets of these business entities, the following indicators were obtained for 2019. Within the whole industry, the maximum asset value was 76 428 210 EUR and the minimum asset value was at the level of 3 314 EUR. The maximum value of tax payable was 2 116 044 EUR and the minimum value of tax payable was 0 EUR (Table 1).

Table 1. Key indicators of selected business entities by assets

Description	Value
Number of evaluated subjects	410
The minimum value of the company's assets	3 314
The maximum value of the company's assets	76 428 210
The average value of assets of selected business entities	1 833 876
The maximum value of the tax payable	2 116 044
The average value of tax payable of selected business entities	14 166

Source: own empirical research based on data of Finstat (2020).

The size of business entities was taken based on the size of the assets of enterprises, given that it is impossible to obtain from open sources the exact numbers of employees of individual business entities in the agricultural sector. Data is available only about the approximate number of employees, because of the total number of 6 540 economic entities, more than 3 000 entities do not specify the number of employees. For the analysis, we selected companies with the paired data on the statistical characteristics of the company's assets and the amount of tax payable. Both statistical characteristics are quantitative.

We used the method of regression analysis to find out how the number of assets affects the tax payable, in other words, how the tax changes on the change in the unit of assets in euros. The model was tested for multicollinearity before regression analysis. The presence of multicollinearity in the model has not been confirmed. Figure 1 shows that the calculated

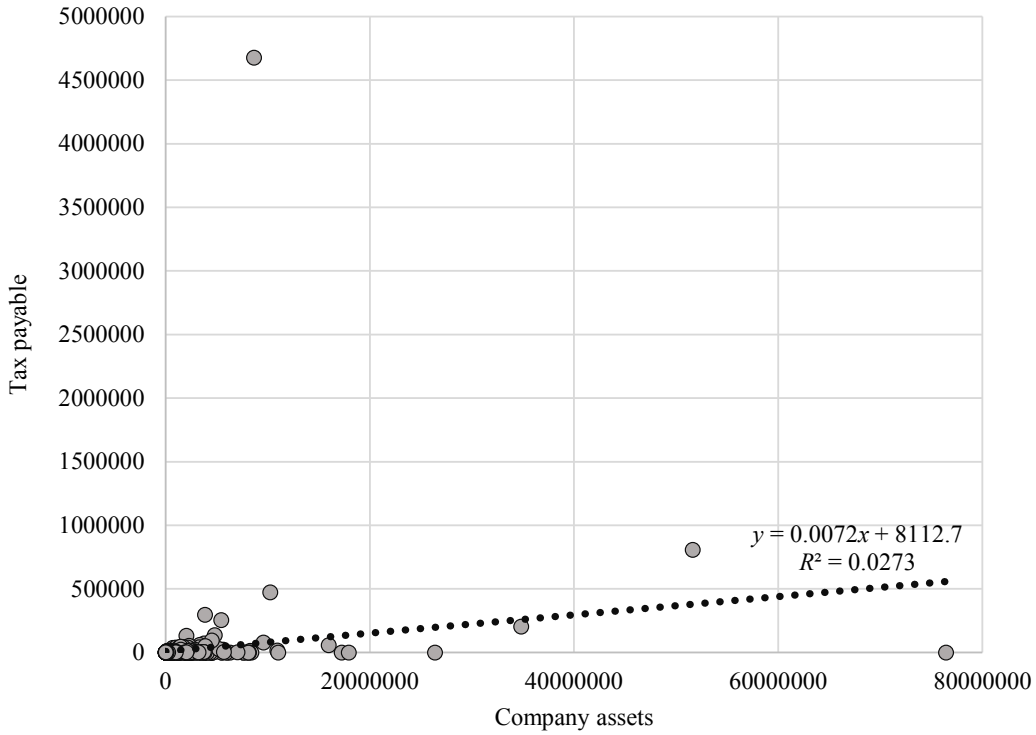

Figure 1. Comparison of enterprise size with tax payable in 2019

Source: own empirical research based on data of Finstat (2020).

coefficient of determination R^2 is 0.0273, indicating that the resulting simple linear model explains the 2.73% variability of the dependent variable (tax payable). The regression function has the form $y = 8\ 112.7 + 0.0072x$. The value of intercept $b_0 = 8\ 097.399$ means, that if the value of the assets were 0, then the amount of tax payable would be 8 112.7 EUR. From the calculated equation of the linear regression line, we can state that in the observed year 2019, an increase in the company's assets by 1 EUR would be associated with an increase in tax payable by 0.0072 EUR, which is insignificant. Figure 1 shows that there is a minimal positive relationship between tax payable and the company's assets.

At the same time, a non-linear regression analysis was performed. The coefficient of determination was 0.3938, which means that the estimated logarithmic regression model explains 39.38% of the variability. The model and coefficients are statistically significant ($p < 0.05$). The calculated values of the regression equation are also elasticities and can be interpreted in such a way: the growth of the company's assets by 1% will lead to an increase in tax payable by an average of 0.19%.

Based on the conducted qualitative and quantitative survey, it was possible to obtain answers to the established research question: 'What effect does the size (assets) of the company have on the economy of the enterprise depending on the volume of income taxes levied within the selected agricultural sector?'. The impact of the size of the enterprise on the economy of the enterprise has minimal dependence on the volume of income taxes levied within the agricultural sector. Based on the analysis carried out, it could be concluded that there is a minimal impact related to the size of the company expressed by the size of the company's assets and the amount of taxes levied (represented by the amount of taxes payable). If the assets of individual business entities were increased by 100%, there would be only a 1.03% increase in

tax payable, which can be considered as a negligible increase in tax payable. At the same time, as follows from the linear regression model, if the companies increase their assets by 1 EUR, the amount of tax payable will increase by 0.00195 EUR. It also follows from the above that the impact of the size of the company on the amount of levied taxes is weakly dependent.

Also, hypotheses were determined based on the acquired theoretical knowledge and the established research questions. These hypotheses were considered based on the obtained input data, their analysis, intercomparison, and evaluation, which allowed testing hypotheses.

H1: 'An increase in the non-taxable part of the tax base will have a positive impact on the business economy in the selected agricultural sector of the national economy'. This hypothesis has been refuted. This hypothesis was examined in the context of the implemented questionnaire quantitative survey. Based on the above questionnaire survey, the following can be stated: the majority of respondents (92.7%) stated that the non-taxable part of the tax base was justified, 42.6% of respondents stated that it would be effective to increase the amount attributable to the non-taxable part of the tax base, 20.5% of respondents stated that the non-taxable part of the tax base should apply not only to natural persons but also to legal entities. Although most of the respondents consider that the non-taxable part of the tax base should be maintained and the amount of such non-taxable part of the tax base be increased, and at the same time that this item also applies to legal entities, this cannot be stated with confidence that increasing the amount of the non-taxable tax base would automatically contribute to the development of business entities and would have a positive impact on the economy of individual business entities within the sector. At the same time, the non-taxable part of the tax base currently applies only to natural persons, while in the given agricultural sector of the national economy other forms of business prevail.

H2: 'The reduction of the tax rate for enterprises with a turnover of up to 100 000 EUR per year will support the innovative potential of small businesses within the selected agricultural sector'. This hypothesis was refuted. There is no direct link between the innovation potential of small businesses and the level of the tax rate for such businesses with a turnover of up to 100 000 EUR. Within the agricultural sector, the analysis showed that companies with a turnover of up to 100 000 EUR pay taxes to a much lesser extent, which means that a possible reduction in the tax rate will not have a significant impact on their economic situation. At the same time, it cannot be assumed that the saved funds for income tax will be used by the company within the given sector for research or innovations. By reducing that tax rate, the money saved would support the economic position of businesses in the agricultural sector.

As a result of studying the impact of tax policy on the business economy, the following conclusions were made: agricultural enterprises are interested in reducing the income tax rate for both individuals and legal entities, businesses are interested in introducing a flat tax system, businesses are interested in maintaining deductible items and the non-taxable personal income tax base.

At present, there is no consensus among experts, politicians, and economists about what the optimal model of tax policy should look like, which would allow taxpayers to pay as low taxes as possible and at the same time would allow the state to collect sufficient funds to ensure its activities and functions. Each country tries to build its tax system, which consists of a tax policy and a tax system. Changes within the tax system can be made through legislative measures, which can be partial or complex, and which are often called tax reforms (Schultzová, 2012). Changes in tax compliance costs caused by the harmonization of corporate tax bases would have a significant and positive impact on gross domestic product (GDP) and welfare (Barrios, d'Andria and Gesualdo, 2020).

Our goal was to find an efficient variant of taxing enterprise income that would have a positive effect on the business activity and competitiveness of agricultural companies, and at the same time, such taxation would still be beneficial for the state. However, the role of the state should be to create a tax system that will be considered fair by both individual tax authorities and governments. Since such a tax system will fulfil state budgets so that the state and public

institutions can implement their policies. Therefore, it is necessary to constantly research the issue of taxes so that the resulting tax system is constantly improved.

The main challenge for the future is to develop an assistance mechanism for enterprises whose activities will be paralyzed by the emergence of a national or global crisis. This mechanism should include the following measures:

- direct non-repayable financial assistance to affected enterprises;
- cheap reimbursable financial assistance to businesses due to reduced sales and maintaining employment;
- the creation of a permanent employment fund (*kurzarbeit*), to which enterprises will contribute and raise the necessary funds in the case of a crisis;
- tax incentives for income tax, as well as VAT for business entities (income tax) and certain commodities (value-added tax) within the certain sectors that will be most affected by the crisis.

CONCLUSIONS

In the research paper, we assessed the impact of tax policy on the assets of enterprises in the agricultural sector. We defined the theoretical basis of the paper with a focus on tax and tax policy, the structure of the tax system, and tax burden, as well as describe tax trends in the European Union and their impact on the business sector.

From the results of the study, it can be concluded that there is a minimal relationship between the size of the enterprise, expressed by the size of assets and the tax payable. Enterprises in the agricultural sector prefer that fixed costs and the non-taxable part of the tax base be preserved, which may also be because some of the enterprises in this sector operate as natural persons – private farmers. Business entities operating in the agricultural sector agree that business entities with a turnover of up to 100 000 EUR should have a lower tax burden.

The state implements its tax policy through appropriate legislation or tax reforms. At the same time, when developing proposals for adjusting the existing tax policy in the agricultural sector, tax policy should be more closely aligned with the tax policy of the European Union and the Slovak Republic, which may lead to an increase in tax revenues in the sector by increasing the production of certain goods as part of more efficient use of the land fund; increasing tax revenues within the industry due to increasing employment in the industry; improvement of the economic situation of individual enterprises, which could lead to their development and subsequent increase in production, will be directly related to the increase in tax revenues in the agricultural sector.

REFERENCES

1. Barrios, S., d'Andria, D., Gesualdo, M. (2020). Reducing tax compliance costs through corporate tax base harmonization in the European Union. Journal of International Accounting, Auditing, and Taxation, 41, 100355. https://doi.org/10.1016/j.intaccaudtax.2020.100355
2. Bielik, P., Turčeková, N. (2013). Podnikové hospodárstvo [Business economy]. SPU v Nitre, Nitra.
3. Buliková, M., Bielik, P., Belinska, S. (2021). Impact of Tax Policy on the Business Economy. Visegrad Journal on Bioeconomy and Sustainable Development, 10 (1), pp. 19-23.
4. Cooper, M., Nguyen, Q.T.K. (2020). Multinational enterprises and corporate tax planning: A review of literature and suggestions for a future research agenda. In International Business Review, 29 (3), 101692. https://doi.org/10.1016/j.ibusrev.2020.101692
5. European Commission (2015). Action Plan on Corporate Taxation. Retrieved from: https://ec.europa.eu/taxation_customs/business/company-tax/action-plan-corporate-taxation_en [accessed 05.04.2021].
6. Ficbauer, J., Ficbauer, D. (2012). Medzinárodní účetní standardy a daňové systémy [International accounting standards and tax systems]. Key Publishing, Ostrava.
7. Finstat (2020). Firmy s finančnými údajmi – databáza hospodárskych výsledkov slovenských firiem [Companies with financial data – database of economic results of Slovak companies]. Retrieved from: https://finstat.sk/databaza-financnych-udajov?Activity=po%C4%BEnohospod%C3%A1 rstvo+a+lesn%C3%ADctvo&Region=&SalesFrom=&Employee=&Years=2018&PerPage=20&Sort=payed-tax-desc&Tab= [accessed 05.04.2021].
8. Gruziel, K., Raczkowska, M. (2018). The Taxation of Agriculture in the European Union Countries. Problems of World Agriculture, 18 (33), pp. 162-174.

9. Harumová, A., Kubátová, K. (2006). Dane podnikateľských subjektov [Business taxes]. Poradca podnikateľa, Žilina.
10. Kovács, L. (2016). Tax Harmonisation versus Tax Competition in Europe. Retrieved from: https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_05_624 [accessed 15.04.2021].
11. Nemec, J., Burák, E. (2016). Optimising the Slovak Tax Policy and Tax System Performance. In: J. Krajíček, V. Kajurová (Eds) European Financial Systems 2016, Proceedings of the 13th International Scientific Conference. Masarykova Univerzita, Brno, pp. 65-71.
12. Schultzová, A. (2012). Daňové sústavy štátov Európskej únie. Vydavateľstvo Ekonóm, Bratislava.
13. Terra, B.J.M., Wattel, P.J. (2012). European Tax Law. Wolters Kluwer Laws and Business, Amsterdam.
14. Trautmann, L. (2014). Köz-gazdaság: Tudományos füzetek. Különszám az adópolitikaráról. Corvinus Egyetem, Budapešť.
15. Vančurová, A., Láchová, L. (2018). Daňový systém ČR 2018. VOX, Praha.

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FINANCIAL CONTROLLING AND LIQUIDITY MANAGEMENT IN AGRICULTURAL ENTERPRISES IN THE SLOVAK REPUBLIC

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ABSTRACT

Controlling as an in-house management system is not only focused on profit management and cost control, but also in the area of corporate liquidity. Its use in liquidity management, the ability of the company to meet liabilities, and deepening financial planning and financial control is a key factor in the financial health of the company. The main goal of the paper is to quantify and analyse liquidity in agricultural enterprises in a selected region of the Slovak Republic. Liquidity is the ability of a company to transform assets into money and pay its liabilities on time. Effective financial management is one of the basic tasks of financial control. The main source of information for this control is the financial statement of companies. Based on the data from the financial statements of agricultural enterprises operating in the Nitra Region, we quantified and evaluated the development of current, quick, and cash ratio liquidity, as well as credit less and corrected liquidity for the period 2015–2019. The Nitra Region is one of the regions where agricultural activity has favourable conditions for its development. We analysed a total of 149 farms. From the point of view of the legal form, agricultural cooperatives show more favourable results of 'classic' and credit fewer liquidities in all years. On the contrary, from the point of view of the calculation of corrected liquidities, which take into account the binding of selected items of assets and liabilities, trading companies achieve better results than agricultural cooperatives.

Key words: liquidity, indicators, agricultural companies, financial controlling
JEL codes: M21, Q10, Q14

INTRODUCTION

The success of each company is reflected in its financial condition. The financial situation of the company systematically and comprehensively reflects the quality of business activities and their economic level, so it is a good starting point and means to diagnose the advantages and disadvantages of business activities. On the one hand, it is the internal environment of financial analysis, but the external environment has the same importance. The company presents itself to its partners on the market through its financial position and uses it as a basis for evaluating and determining the terms of the business relationship. The main aim of

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this paper is to evaluate the liquidity indicators in agricultural companies during the period 2015–2019 and evaluate their ability to pay their liabilities. Financial control is part of the company's management system. The main task is to achieve liquidity and the company's ability to pay its obligations at the proper time.

THEORETICAL BACKGROUND

In recent years, Slovak agriculture has gone through a difficult period of development of the recession and currently persists in stagnation and the decline of decisive economic and production indicators in comparison with most EU countries. The economic efficiency of agriculture and the changes that are gradually taking place in the current period in all the Member States of the European Union are significant from the point of view of the European market area. The economy of agriculture is influenced by several factors, but the decisive role in this process is played by the Common Agricultural Policy (CAP), which significantly affects the economy of agricultural enterprises through support (Chrastinová and Uhrinčaťová, 2014). Financial relations, especially their quality and objectivity between creators and participants in the business environment play a crucial role in the current stage of development of the company, in which reflections on the current state come to the fore and the possible direction of crisis and post-crisis adaptation processes in the world economy as a whole. These conditions apply in particular to business entities operating in a rural area (Serenčéš et al., 2014). Knowing where a company stands today is a necessary prelude to contemplating where the company might end up in the future. One of the options for supporting short-term and long-term decisions is financial analysis (Brealey, Myers and Allen, 2011). Financial ratios have traditionally been indicators of a corporation's overall performance (Rahman et al., 2017) and may help to quantify the potential impact of internal ratings on financial performance (Belas et al., 2012; Klieštik et al., 2020). The practice of s mall and medium enterprises in Slovakia do not dispose of a unified monitoring methodology and appraisal of financial controlling (Sedliačiková, Vacek and Sopková, 2015).The aim of financial controlling is to secure the liquidity and financial stability of an organization. The structure of financial controlling can be described as the cycle comprising debt controlling, inventory controlling – controlling of working capital, ongoing liquidity controlling, and controlling of short-term liquidity surpluses and deficits (Vaceková, 2013). Liquidity is an important indicator of a company's performance and its ability to cover short-term liabilities within maturity. It can be measured in several ways, using the current liquidity ratio which analyses current assets and short-term liabilities. Companies have to take into account the liquidity and profitability ratio, i.e. to the level of a surplus of liquid funds, so as not to be exposed to opportunity costs. It is necessary to maintain an optimal ratio between these two principles because only in this way it is a possibility to achieve a positive impact of liquidity on the profitability level of the company (Jelena et al., 2018). Agriculture as an industry can be characterized as an industry with low liquidity. In the case of each ratio, the generally recommended value was recorded only by 25% of the best companies regarding liquidity (upper quartile). Therefore the value of the upper quartile can be used as a benchmark for liquidity ratios (Tóth, Čierna and Serenčéš, 2013). The average level of current farm liquidity in the EU countries ranged from 4.4 to 6.6, while the average level of fast liquidity from 2.9 to 4.9. Thus, in the light of the normative values, it is a high level of financial liquidity. The optimum levels of liquidity presented in the literature are not applicable to agricultural holdings. There are very large differences in the level of liquidity of farms between the EU countries (Jedrzejczak-Gas and Janina, 2020). Liquidity is dependent on the economic size of farms – both the current and quick liquidity is lower the higher the economic size of the farm. There is a significant variation in the financial liquidity of agricultural holdings by type of farming. Surplus liquidity can affect the financial behaviour of companies and accompany them in generating overinvestment in projects. Likewise, the increase in capital of the companies can play a significant role in increasing their leverage (Khanghah and Partovi, 2020). The COVID-19 pandemic has seated a new frame and new challenges in the business sector. The companies are faced with a possible economic shutdown because the COVID-19 is putting

pressure on companies' business performance from all sectors, directly impacting revenues, profitability, and liquidity. Companies' liquidity suddenly becomes very challenging across the globe as the coronavirus pandemic rapidly escalates. Companies can operate in the short term without profitability, but they are doomed to bankruptcy without liquidity immediately (Pepur, Laca and Basic, 2021). With a sufficient amount of liquid assets it is hardly possible to reach satisfactory profitability. Consequently for strategic financial controlling the following sequence should be taken into consideration: liquidity precedes profitability (Zéman, 2017). In these times, every company need to maintain its ability to pay its debts. Such solvency represents one of the most important factors of financial health (Vitková, Vankova and Kocourkova, 2022).

MATERIALS AND METHODS

The basis for the processing paper was data from the financial statements of agricultural enterprises operating in the Nitra Region in the Slovak Republic. It is these data from the financial statements (balance sheet, profit, and loss statement) that are the basic source of information for financial controlling. Agricultural enterprises are divided according to their legal form into trading companies and agricultural cooperatives, while these forms have the largest representation in the agricultural sector in the Slovak Republic. We analysed 47 agricultural cooperatives and 102 trading companies from the Nitra Region, during the period 2015–2019.

The main task of financial controlling is to effectively manage the financial sources of the company. Financial controlling is a comprehensive set of tools aimed at ensuring more efficient work in the field of financial management. One of the tools of financial controlling is the regular evaluation of the company's liquidity, which clarifies the management of financial sources and provides information in real-time. The paper aims to point out the importance of financial controlling in managing the liquidity of agricultural enterprises. In this paper, we quantify and evaluate the liquidity of agricultural enterprises operating in the Nitra Region, determine whether these companies can pay their liabilities on time, and compare the quantified results between trading companies and agricultural cooperatives. In conclusion, we point out that regular evaluation of liquidity as one of the tools of financial controlling is one of the prerequisites for the solvency of companies. Liquidity is the company's ability to transform its assets into cash as soon as possible and pay its debts on time. Our liquidity is quantified according to Gurčík (2018), who, in addition to current, quick, and cash ratio liquidity, also writes about operating and corrected liquidity.

Current liquidity defines, how many times a company can pay off debts if it monetizes its short-term assets. In addition to items from current assets, the author also includes future income short-term in the numerator:

$$current\ liquidity = \frac{financial\ accounts + ST\ financial\ assets + stocks + ST\ receivables + future\ incomes\ ST}{ST\ debts + future\ expenditures\ ST}. \quad (1)$$

Quick liquidity expresses the ability to pay off debts, without money from the sale of stocks:

$$quick\ liquidity = \frac{financial\ accounts + ST\ financial\ assets + ST\ receivables + future\ incomes\ ST}{ST\ debts + future\ expenditures\ ST}. \quad (2)$$

Cash ratio liquidity is the ratio of the most liquid part of the assets, which consists of cash in the financial accounts and short-term financial assets, and short-term debts together with future expenditures short-term from time resolution of liabilities:

$$cash\ ratio\ liquidity = \frac{financial\ accounts + ST\ financial\ assets}{ST\ debts + future\ expenditures\ ST}. \quad (3)$$

Corrected liquidity takes into account the binding of individual asset and liability items. The binding of assets items is related to operating sales (sales from the sale of goods, sales of own products, services) and the binding of liabilities items is related to operating costs (costs of goods sold, production consumption, adjustments to stocks):

$$corrected\ current\ liquidity = \frac{corrected\ ST\ assets}{corrected\ ST\ debts}, \tag{4}$$

$$corrected\ quick\ liquidity = \frac{financial\ accounts + ST\ \ financial\ assets + corrected\ ST\ receivables}{corrected\ ST\ debts} \tag{5}$$

$$corrected\ cash\ ratio\ liquidity = \frac{financial\ accounts + ST\ \ financial\ assets}{corrected\ ST\ debts} \tag{6}$$

where:
corrected ST assets = financial accounts + ST financial assets + corrected stocks + corrected *receivables and future incomes ST*,
corrected stocks = stocks · (1 – *binding of stocks – binding of receivables*),
corrected ST receivables = ST receivables + future incomes ST · (1 – *binding of receivables and future incomes ST*),
corrected ST debts = ST debts · (1 – *binding of ST debts*).

In addition to selected liquidity indicators, we quantified selected basic statistical indicators within individual indicators such as minimum and maximum value of quantified liquidity in the set of agricultural holdings, median, average. For each liquidity, we determined the interval and determined the percentage of companies that belong to each interval.

RESEARCH RESULTS AND DISCUSSION

One of the tools of financial controlling is liquidity controlling, which helps companies avoid late payments, prevents inefficient management of financial resources, and leads to their proper use. Serenčéš et al. (2014) argue that the financial health of a business entity in agriculture is conditioned by financial stability and liquidity, so we consider the examination and management of liquidity to be one of the most important tools of financial controlling. The Nitra Region is located in the southwestern part of Slovakia. With its area of 6 344 km^2, it occupies 12.9% of the country's territory. The region has a lowland character, its predominant part is quality agricultural land. The total area of agricultural land in the Nitra Region is at the level of 464 225 ha, which is the highest representation among the eight regions of the Slovak Republic. Arable land accounts for 87% of agricultural land. From the point of view of climatic conditions, it is one of the warmest areas, which means that it has favourable conditions for the development of agricultural production. From the point of view of the business structure, the agricultural sector of the Slovak Republic is composed of trading companies, cooperatives, and natural persons. The number of workers in this sector has shown a declining trend in recent years, but the turnaround occurred in 2019 when the number of people employed in the agro sector increased. The average monthly wage in agriculture has increased in recent years but does not reach the level of the average wage in the country's national economy.

Liquidity management and reinsurance is key factor in a company's financial health. It consists of income planning and expenditure in such a way that the payment strength of the day is maintained and that there are no short-term deficits or excesses of liquidity. Liquidity management through financial controlling should lead to the optimal use of credit limits, efficient use of funds, avoidance of late payments, and thus avoid additional costs. Liquidity ratios have their irreplaceable position in the description of the financial situation of business entities.

Looking at the calculated values of the cash ratio liquidity indicator, we can conclude, that exist fundamental differences between agricultural cooperatives and trading companies. The liquidity of both categories of agricultural holdings was constant throughout the period under analysis. It can be stated that this indicator was characterized by low volatility. In the case of agricultural cooperatives, in all the years under review, the cash ratio liquidity indicator touched the lower limit of the recommended range. On the other hand, trading companies were characterized by low cash ratio liquidity, which did not reach even in one year the minimum limit of recommended values. The cash ratio liquidity indicator expresses the company's ability to pay its short-term liabilities from easily monetizable sources. The relatively low values of this indicator, either below the lower limit or at the lower end of the recommended range, raise slight solvency concerns, indicating that primary agricultural holdings may have had difficulty repaying short-term liabilities. The median value of this indicator in trading companies in 2019 reached the level of 0.0861, which means that agricultural primary production enterprises were able to pay 8.61% of short-term debts from cash and bank accounts (Table 1).

Quick liquidity expresses the company's ability to cover its liabilities with cash and bank accounts (financial accounts) and short-term receivables. Even with this indicator, we can state that agricultural cooperatives achieve more favourable values than trading companies. In agricultural cooperatives, the values of quick liquidity are within the limits of the recommended values in 2017–2019. Values of the quick liquidity ratio higher than 1 indicate that after the company has repaid its short-term debts, it still has a certain reserve and does not have to realize stocks to repay short-term liabilities. As can be seen in Table 2 the indicator of quick liquidity in trading companies did not reach even the recommended minimum value in any of the analysed years. This situation was caused by the fact that since 2015 the level of short-term liabilities has been continuously increasing. One indicate that companies were forced to liquidate stocks to pay their short-term liabilities (Table 3). The level of quick liquidity was the lowest in 2016 for both categories of analysed companies.

Agricultural cooperatives outperformed the trading companies in terms of overall liquidity. The indicator of total liquidity of agricultural cooperatives reached favourable values within the range of recommended

Table 1. Development of cash ratio liquidity and number of companies in the cash ratio liquidity interval, 2015–2019

Indicator	2015		2016		2017		2018		2019	
Cash ratio liquidity in AC	0.2744		0.2500		0.2788		0.2933		0.2673	
Cash ratio liquidity in TC	0.1472		0.1211		0.1454		0.1260		0.1394	
MIN AC	0.0003		0.0002		0.0002		0.0005		–0.0083	
MIN TC	–0.3473		–0.4899		–0.1759		-0.9714		–1.2524	
MAX AC	16.5392		15.1581		42.3454		14.8610		12.8518	
MAX TC	25.1749		9.2579		21.2909		32.8120		55.6705	
MEDIAN AC	0.2393		0.1157		0.1511		0.1348		0.1837	
MEDIAN TC	0.1267		0.0946		0.1049		0.0764		0.0861	
AVERAGE AC	1.1612		1.1437		2.1545		1.1026		1.0788	
AVERAGE TC	1.0930		0.6446		0.8036		1.3111		1.3402	
Number of companies in interval AC/TC (%)										
0–0.19	47	60	68	66	53	58	60	60	49	61
0.20–0.80	25	24	7	20	17	27	15	19	23	20
0.81 and more	28	16	25	14	30	15	25	21	28	19

AC – agricultural cooperatives, TC – trading company.

Source: authors' own processing, farms accountancy statements

Table 2. Development of quick liquidity and number of companies in the quick liquidity interval, 2015–2019

Indicator	2015		2016		2017		2018		2019	
Quick liquidity in AC	0.9857		0.9337		1.0655		1.0555		1.1080	
Quick liquidity in TC	0.6715		0.6594		0.6995		0.6411		0.7081	
MIN AC	0.0651		0.0290		0.0745		0.0427		0.0267	
MIN TC	0.0020		0.0018		0.0026		0.0018		0.0026	
MAX AC	18.2972		16.6194		51.2251		16.1549		13.8780	
MAX TC	38.0639		13.7116		62.3139		39.1492		66.9807	
MEDIAN AC	0.6235		0.5593		0.7015		0.8051		0.6090	
MEDIAN TC	0.6104		0.6522		0.7298		0.6776		0.7787	
AVERAGE AC	1.8567		1.8720		3.1252		1.8665		1.8590	
AVERAGE TC	2.0203		1.4540		2.4607		2.7363		3.2488	
Number of companies in interval AC/TC (%)										
0–0.99	57	70	66	71	60	67	60	58	64	57
1.00–1.5	9	13	6	10	6	13	10	17	6	17
1.51 and more	34	17	28	19	34	20	30	25	30	26

Source: authors' own processing, farms accountancy statements.

Table 3. Development of current liquidity and number of companies in the current liquidity interval

Indicator	2015		2016		2017		2018		2019	
Current liquidity in AC	1.9656		1.8192		1.9591		2.0114		2.0972	
Current liquidity in TC	1.1281		1.1039		1.1676		1.1095		1.2614	
MIN AC	0.3610		0.3907		0.3326		0.1892		0.1517	
MIN TC	0.0020		0.0018		0.0026		0.0018		0.0026	
MAX AC	26.5043		25.1133		69.8231		21.9854		23.0782	
MAX TC	24.9768		18.2399		69.5714		53.5207		66.9807	
MEDIAN AC	1.7339		1.5049		1.6463		2.2359		1.9239	
MEDIAN TC	1.0203		1.1098		1.0807		1.0906		1.3127	
AVERAGE AC	3.8230		3.4765		5.1557		3.3891		3.4703	
AVERAGE TC	2.3512		2.1159		2.8998		3.3042		4.3085	
Number of companies in interval AC/TC (%)										
0.00–1.49	40	67	45	66	43	65	38	63	38	56
1.5–2.5	22	18	19	18	12	16	22	15	26	19
2.51 and more	38	15	36	16	45	19	40	22	36	25

Source: authors' own processing, farms accountancy statements.

values. Every year, the continuous growth of this indicator is observed, which increases the probability of the necessary repayment of short-term debts.

In 2018 and 2019, the optimal level of current liquidity was achieved, which means that to repay short--term debts, only one part of the book value of short--term liquid assets needs to be monetized. The liquidity of trading companies did not even reach the level of the minimum recommended value in any of the analysed years. This raises concerns about the solvency of companies that expose themselves to financial risk. The current liquidity of both types of analysed companies was comparable in 2016, as well as within the previous two indicators. The median value of the current liquidity ratio in 2019 was 1.929 within agricultural cooperatives and 1.317 within trading companies.

The favourable development of binding corrected the cash ratio liquidity not only of agricultural cooperatives but also of trading companies in all analysed years. The corrected cash ratio liquidity of cooperatives reached the recommended values in each analysed year. Most cooperatives were in the range of recommended values in 2015 and 2018 (26% and 25%). The values of corrected cash ratio liquidity above the recommended values were reached by most cooperatives in 2017 (38%). For comparison with the indicator of cash ratio liquidity this year, only 17% of cooperatives and 30% of trading companies exceeded the upper limit level. In the case of trading companies, the highest values were in the range of recommended values of corrected cash ratio liquidity, i.e. 21% of companies in 2017 (Table 4).

Looking at Table 5 it is clear, that the values of the corrected quick liquidity indicator are, in the case of cooperatives, below the limit of the recommended values. In this case, it can be said that the values of corrected quick liquidity developed unfavourably compared to quick liquidity. The largest decrease in corrected quick liquidity compared to conventional quick liquidity is recorded in the case of cooperatives in 2019, a decrease of 45%.

The situation is diametrically different for trading companies. The values of quick liquidity developed favourably after its correction, where we record an increase in the corrected quick liquidity compared to the conventional one in each analysed year. The largest increase occurred in 2015, by 780%.

Corrected current liquidity shows different values compared to conventional current liquidity. In the case of cooperatives, the situation remained unchanged, as in each monitoring period this indicator reached the range of recommended values. However, for the trading companies, the values of this indicator significantly exceeded the upper limit of the recommended values. Comparably high values of the corrected current liquidity ratio are achieved in 2015 and 2018 and indicate inefficient use of current assets. The results of descriptive statistics, specifically the standard deviation and variance that can be seen in Table 6, which points out that within the analysed group of companies there are more significant deviations from the calculated average value and a larger variance, which in practice means that in the group

Table 4. Development of corrected cash ratio liquidity and number of companies in the corrected cash ratio liquidity interval, 2015–2019

Indicator	2015		2016		2017		2018		2019	
Corrected cash ratio liquidity AC	0.6546		0.7233		0.6985		0.7066		0.6122	
Corrected cash ratio liquidity TC	1.6478		0.9606		0.8388		1.3183		0.5554	
MIN AC	–0.2681		–0.2791		–0.1352		–6.9378		–24.5635	
MIN TC	–6.0192		–44.7791		–13.7015		–10.2077		–8.8309	
MAX AC	17.6907		16.3180		42.9899		16.2011		13.8042	
MAX TC	34.1446		14.6132		21.7504		33.6187		56.4844	
MEDIAN AC	0.3665		0.1831		0.4565		0.2710		0.1685	
MEDIAN TC	0.0417		0.0094		0.0696		0.0137		0.1016	
AVERAGE AC	1.4002		1.4177		2.5604		1.2859		0.6353	
AVERAGE TC	1.5317		–0.3715		0.5947		1.1486		1.4753	
Number of companies in interval AC/TC (%)										
0–0.19	38	59	51	68	43	57	45	62	51	56
0.20–0.80	26	17	15	15	19	21	25	14	19	20
0.81 and more	36	24	34	17	38	22	30	24	30	24

Source: authors' own processing, farms accountancy statements.

Table 5. Development of corrected quick liquidity and number of companies in the corrected quick liquidity interval, 2015–2019

Indicator	2015		2016		2017		2018		2019	
Corrected quick liquidity AC	0.6546		0.7233		0.6985		0.7066		0.6123	
Corrected quick liquidity TC	5.2352		3.5836		2.8865		4.7601		2.0431	
MIN AC	–0.3684		–21.5417		–0.9579		–50.8175		–29.1551	
MIN TC	–31.5824		–101.3634		–132.449		–19.5129		–91.4238	
MAX AC	19.4133		17.7672		51.0979		17.5058		116.0923	
MAX TC	40.1734		10.8786		33.9143		243.3513		56.4844	
MEDIAN AC	1.3087		1.2756		1.5137		1.0793		0.9395	
MEDIAN TC	0.7522		0.6368		1.0011		0.8068		0.8445	
AVERAGE AC	2.5776		1.6925		4.1395		0.6380		4.0596	
AVERAGE TC	1.8103		–1.9438		0.1902		4.0665		0.3564	
Number of companies in interval AC/TC (%)										
0–0.99	34	53	47	58	32	47	43	52	53	55
1.00–1.5	23	15	13	19	17	23	17	14	9	20
1.51 and more	43	32	40	23	51	30	40	34	38	25

Source: authors' own processing, farms accountancy statements.

Table 6. Development of corrected current liquidity and number of companies in the corrected current liquidity interval, 2015–2019

Indicator	2015		2016		2017		2018		2019	
Corrected current liquidity AC	1.2132		1.2751		1.2833		1.2052		1.0711	
Corrected current liquidity TC	6.6298		4.6269		3.7964		6.2804		2.7536	
MIN AC	–1.0994		–22.5255		–1.7895		–52.1679		–48.4161	
MIN TC	–35.3403		–101.3634		–151.091		–22.9635		–99.2489	
MAX AC	24.0168		37.0597		64.1019		21.2359		120.4639	
MAX TC	49.4919		198.8653		31.1501		243.351		69.3957	
MEDIAN AC	2.0533		2.0190		2.5581		2.0704		1.8929	
MEDIAN TC	1.4620		0.6392		1.2931		1.3857		1.2922	
AVERAGE AC	3.5457		3.2865		5.4303		1.2112		4.5945	
AVERAGE TC	2.2027		-0.0074		0.5230		5.0248		1.0206	
Number of companies in interval AC/TC (%)										
0.00–1.49	28	52	32	61	30	53	38	51	34	56
1.5–2.5	29	22	30	23	19	20	22	22	32	22
2.51 and more	43	26	38	17	51	27	40	27	34	22

Source: authors' own processing, farms accountancy statements.

there are enterprises that achieve either very high or very low values of this indicator, which deviate from average. The median value of this indicator within the trading companies at the level of 1.2922 and cooperatives at the level of 1.8929 points to some failures when paying the short-term debt.

CONCLUSIONS

The implementation of financial controlling is a process that consists of several actions. One of them is liquidity management. Real-time information is essential to manage and ensure liquidity. This is the

task of regular quantification of liquidity as one of the tools of financial controlling. Liquidity control is an area that helps ensure that a company is solvable and prevents the company from acting irrationally in managing its funds. If a company does not monitor and manage liquidity, it can lead to major problems with customers, states, employees, and other entities that are in a certain relationship with the company (Jacková, 2019). The sample of companies examined consisted of two categories of legal forms of agricultural holdings, namely cooperatives and trading companies. Taking a closer look at the different categories of liquidity ratios, we have concluded that cooperatives have better solvency compared to trading companies. When examining conventional liquidity, in most of the years under analysis, the liquidity of cooperatives (whether current, quick, or cash ratio) was within the recommended values. On the other hand, the short-term liquidity of trading companies was insufficient, the values of conventional liquidity ratios were below the minimum recommended values, which indicates problems with the payment due of short-term debts and there is a risk of insolvency. When evaluating the calculated indicators of operating liquidities, we found more favourable results for both categories of analysed companies. The liquidity of cooperatives was again characterized by reaching values within the recommended interval, the liquidity of trading companies approached the lower limit of the recommended values. On the other hand, the calculations of corrected liquidity ratios brought conflicting results compared to conventional liquidities, especially in terms of corrected current and quick liquidity. In the case of these two indicators, the calculated values for cooperatives decreased and in the case of trading companies, there was an enormous increase. Not only liquidity values below the recommended minimum limit are financially risky for the company, but also values exceeding the maximum recommended limit. Because high liquidity values point to inefficient use of short-term liquid assets. Therefore, from the point of view of business owners, as well as business management, it is more efficient if liquidity ratios are close to the lower limit of the recommended values. In terms of liquidity management, we assess that cooperatives are characterized by a significantly better level of financial controlling and financial management itself than trading companies. They are not as highly exposed to insolvency as trading companies and their liquidity and solvency management is better secured and sophisticated from a financial controlling perspective. It follows that companies should quantify liquidity at shorter intervals to obtain real-time information, as required by financial controlling. This will allow them to make decisions on financial resources in such a way as to prevent insolvency. Future research should also focus on other components of financial controlling, not only liquidity management, but e.g. for financial planning, financial control, or controlling of working capital.

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REFERENCES

1. Belas, J., Cipovova, E., Novak, P., Polach, J. (2012). Impacts of the foundation internal ratings-based approach used on the financial performance of the commercial bank. E&M Ekonomie a Management, 15 (3), pp. 142-154.
2. Brealey, R.A., Myers, S.C., Allen, F. (2011). Principles of corporate finance. McGraw-Hill Education, New York, NY.
3. Gurčík, Ľ. (2018). Podnikateľská analýza a kontroling. Slovenská poľnohospodárska univerzita, Nitra.
4. Chrastinová, Z., Uhrinčaťová, E. (2014). Slovenské poľnohospodárstvo v kontexte štátov EÚ. Ekonomika poľnohospodárstva, 14 (2), pp. 1-28.
5. Jacková, A. (2019). Assessment of the Company's Financial Situation Through Liquidity and its Indicators. AD Alta-Journal of Interdisciplinary Research, 9 (2), pp. 90-92.
6. Jedrzejczak-Gas, J. (2020). Diversification of Farm Liquidity in the EU. In: K.S. Soliman (Ed.) Proceedings of the 35th International Business Information Management Association Conference (IBIMA), 1-2 April 2020 Seville, Spain. Education excellence and innovation management: a 2025 vision to sustain economic development during global challenges. International Business Information Management Association, Sevilla, pp. 13805-13814.

7. Jelena, A., Kristina, M., Vera, M., Branimir, K. (2018). The modeling factors of agricultural companies' performances. Custos e @gronegócio on line, 14 (4), pp. 223-240.
8. Khanghah, E.R., Partovi, B. (2020). Study of the Relationship between Overinvestment, Leverage, and Liquidity in Companies Listed in Tehran Stock Exchange. Revista Genero & Direito, 9 (2), pp. 558-572.
9. Pepur, P., Laca, S., Basic, I. (2021). The Impact of COVID-19 on the Company's Liquidity. Interdisciplinary Management Research, 17, pp. 757-769.
10. Rahman, A., Belas, J., Kliestik, T., Tyll, L. (2017). Collateral requirements for SME loans: empirical evidence from the Visegrad countries. Journal of Business Economics and Management, 18 (4), pp. 650-675. https://www.doi.org/10.3846/16111699.2017.1357050
11. Sedliačiková, M., Vacek, V., Sopková, E. (2015). How Slovak small and medium enterprises perceive financial controlling. Procedia Economics and Finance, 26, pp. 82-85.
12. Serenčéš, P., Tóth, M., Čierna, Z., Rábek, T., Prevužňáková, J. (2014). Benchmarking v Slovenskom poľnohospodárstve. Ekonomika poľnohospodárstva, 14 (2), pp. 1-19.
13. Tóth, M., Čierna, Z., Serenčéš, P. (2013). Benchmark values for liquidity ratios in Slovak agriculture. Acta Scientiarum Polonorum. Oeconomia, 12 (3), pp. 83-90.
14. Vaceková, G. (2013). Financial controlling in non-profit organizations. The case of the Slovak Republic. Risk Governance & Control: Financial Markets & Institutions, 3 (2), pp. 49-57.
15. Vitkova, E., Vankova, L., Kocourkova, G. (2022). Assessment of the Regional Current Liquidity in the Construction Industry of the Czech Republic. Procedia Computer Science, 196, pp. 699-707.
16. Zéman, Z. (2017). The risk-mitigating role of financial controlling at local government entities. Public Finance Quarterly, 3, pp. 294-310.

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DUAL FOOD QUALITY IN SLOVAKIA VERSUS EUROPEAN STATES: ARE CUSTOMERS CONCERNED?

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ABSTRACT

Recently, the topic of dual food quality has been intensively discussed in the media, as well as becoming an issue for European Union institutions. In the presented work, we answer the question of whether the topic of dual food quality is just as interesting for consumers as it is for the media and politicians. In March 2018, a questionnaire survey was conducted on the quality and availability of local foods. A total of 1 984 respondents answered, with 1 224 of them taking the opportunity to answer a general open question regarding the quality and choice of food. Almost 22% of respondents expressed satisfaction with the quality of local foods. Moreover, about 32% expressed a desire for a wider selection of goods with no complaint about quality. The wording of the answers expresses remarkably high confidence in local foods. Only 36 respondents mentioned foods of foreign origin. Opinions on foreign food were either positive, neutral, or negative. Consumer comments have shown that they do not perceive differences in food quality as an issue of interest. Furthermore, it is not possible to unequivocally say whether foreign products are perceived as of higher or lower quality. We recommend repeating a similar survey while the idea of dual quality is not instilled in the respondent during the survey. A similar survey can be conducted in other European countries as well.

Key words: dual quality, product, customers preferences, food
JEL codes: F15, M31, L15

INTRODUCTION

Discussions regarding dual food quality have recently emerged as a high priority on the European level. This topic has always been present in Slovakia in a variety of forms: nostalgia for the good old times, for example, when sugar was sweeter, stories about contaminated food from Chernobyl or Poland, or even legendary western food products from France or Italy. However, it has only become a sensitive topic in recent years, with discussions beginning on the highest political and academic levels.

'Dual quality' is the practice in which companies use different recipes, formulations, or standards for items sold under the same brand name and with very similar-looking packaging. Depending on the market where they are sold, some products might be of lower nutritional value, contain inferior ingredients, or have lower efficacy. Most cases have been reported predominantly about food; however, there is evidence that it also concerns non-food products, such as detergents (e.g. washing liquid) and toiletries (e.g. toothpaste, shampoo) (BEUC, 2018).

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Thanks to the attention given to the topic of dual food quality, we consider it useful to verify whether this subject is of interest to consumers as well. Previous research was conducted in the form of a questionnaire. In the majority of cases, respondents were asked whether they considered dual quality to be a problem, or whether they had even heard about it. Most of the respondents answered affirmatively, regarding the problem of dual food quality as a problem and that they were aware of the issue. However, these results did not confirm whether consumers address the dual quality of products unless the problem had been indicated by the researcher. A rationally-minded consumer cannot say they do not care about the quality of products, or more specifically, the dual quality of food.

The answer to the research question was predicted as so: Consumers in Slovakia do not consider dual food quality in different states of the European Union as a problem.

THEORETICAL BACKGROUND

The issue of 'dual quality' of food products rose to prominence during 2016 and 2017, after tests in the several Member States showed that some branded products, which had been sold under the same or similar brand name and packaging, had either different ingredients or sensory characteristics within the different Member States. The study, of which the results were published in June 2019, followed allegations that companies were selling inferior products in the Member States that joined the EU after 2004; however, the JRC analysis did not reveal any consistent geographical patterns (Šajn, 2019).

The GAIN report presents a specific example of dual quality in food. In Iglo fish sticks, for example, the fish content in Slovakia is lower than its Austrian counterpart. However, the Slovak product contains the same fish content as the product sold in the UK, the Netherlands, and Portugal. A Nestlé representative responded to allegations by stating, 'Our recipes reflect cultural differences between countries and regions, including within the European Union and developed according to local consumer preferences. There may be some minor variations in the ingredients used in some of our products sold within the EU to cater to local consumer preferences' (Walker and Williams, 2017).

The survey was conducted between September and December 2018 and presented a negative reaction against the existence of dual quality in products from 80% of respondents. In total, 919 participants took part in the survey (Bartková, 2019). Respondents were required to answer the following question concerning dual quality: Have you ever heard of the problem of dual quality? 80% of all respondents considered dual quality in food a problem, while only 24% considered it a problem in the case of cleaning products and cosmetics (Bartková and Sirotiaková, 2021). At the same time, 47% of respondents disclosed that they had been informed primarily by the media. Further research on quality perception was conducted in Slovakia where respondents evaluated the overall quality of two different samples of honey (one from a local beekeeper and one imported honey sold in a retail store). Respondents tried to evaluate quality based on sensory attributes such as taste, aroma, consistency, and colour (Šedík et al., 2018). The research confirmed that Slovak respondents prioritize locally-produced products over general quality.

All previous research has shown that respondents have a negative perception of the possible occurrence of dual quality. The occurrence of dual quality has been confirmed (Bíreš, 2018). However, there is no confirmation that it is aimed specifically at member states of Central and Eastern Europe (Walker and Williams, 2017). Despite the existence of dual quality, several heated discussions have developed. Evidence suggests that instrumental aggression may be motivated by some alleged threat (Fromm, 1992).

MATERIALS AND METHODS

In March 2018, we used a questionnaire to find out consumers' preferences towards local and regional agricultural food products. The questionnaire contained 21 questions, including demographic and personal information. We received a total of 1 984 complete answers. Answers were collected electronically. Respondents were asked to answer a questionnaire during doing pa purchases on the biggest e-shop portal in Slovakia.

Males comprised 53% of the total number of respondents with females comprising the remaining 47%. The share of respondents who participated in the survey corresponded to the share of citizens in individual regions of the Slovak Republic as described in Table 1.

Table 1. Geographic distribution of respondents according to different regions in Slovakia

County	*n*	% of the *n*	Population	% the population
City of Bratislava	222	11	422 923	8
Bratislavský kraj	79	4	210 356	4
Trnavský kraj	171	9	559 697	10
Trenčianský kraj	230	12	589 935	11
Nitrianský kraj	238	12	682 527	13
Žilinský kraj	241	12	690 434	13
Banskobystrický kraj	234	12	653 024	12
Prešovský kraj	299	15	820 697	15
Košický kraj	268	14	796 650	15
Total	1 982	100	5 426 252	100

Source: own empirical research.

The share of respondents who participated in taking the questionnaire represented the share of citizens in individual regions of the Slovak Republic. To confirm these claims, we used a paired t-test that corresponded to two middle values. The calculated value of the tested characteristic is larger than the critical value $t_1 - \alpha$, that is, with 95% probability. Based on these results, we can thus use a selected group of respondents from the questionnaire to represent the preferences of the Slovak Republic as a whole.

In the questionnaire, we collected data about customers' opinions about the quality of food products. In the last question (21st), respondents had the opportunity to express their opinion on the quality and availability of food in Slovakia. The question was: Please share with us your opinion on the quality or availability of food. What do you believe is lacking in the Slovak market? Out of the total number of 1 984 respondents, 1 224 respondents were willing to express their opinion in the form of a written text.

The intention of open question number 21 was to collect information about other possible interests of customers above the main goal of research. We analysed how many times the respondents used the words 'foreign', 'imported', 'western', or other word combinations used in the Slovak language, which is associated with products that are not produced in Slovakia.

RESEARCH RESULTS AND DISCUSSION

During collection responses 1 224 respondents took advantage of the opportunity to answer the open question. This comprises 62% of the total number of respondents (1 984). This concerned the last question in the questionnaire. There was no motivation of any kind for answering this question, such as a discount or financial reward. Therefore, it can be inferred that the average respondent is not only interested in food and its characteristics such as quality, but also wants to express their own opinion. Lengths of responses varied, from either one-word answers to several sentences.

From all participating respondents 13% of respondents (or 21% of those who answered the question) wrote that they were satisfied with the current situation. Likewise, 20% of respondents (or 32% of actively answered) used the word 'more' in various forms. Respondents presented the word 'more' using a variety of conjunctions, for example, with selection or quantity. 6% of respondents (or 10%) felt that something was lacking. As a whole, the written comments regarding food on the Slovak market were either positive or very positive. Respondents expressed exceptional confidence in the good quality of domestic products. This was expressed using a variety of words, such as domestic, local, traditional, Slovak, and so on.

Only 36 respondents used a phrase in some form or another referring to products produced outside of Slovakia. This comprises less than 3% of respondents (or less than 2% of the entire number of respondents). Given that this is a very low number of respondents who mentioned foreign-produced products on their own, we can therefore confirm the answer to our research question: Slovak consumers do not consider

dual food quality in different states of the European Union as a problem.

From the answers provided, it is not possible to say unequivocally whether foreign-produced food or food available abroad can be considered of being of higher quality or not. However, the answers show that negative responses were expressed more aggressively, and institutions or companies, especially those from abroad, were attributed to having bad intentions:

- 'Slovakia should be self-sufficient and not import harmful, cancer-causing waste from around the world';
- 'More Slovak food products. They are of higher quality than from Poland or the "waste" sent to us from the west';
- 'Real quality food and not "pretend" quality food products that deceive consumers';
- 'As far as the availability of quality food is concerned, we know that fewer quality products are exported to Slovakia, even though we do not have any food shortage here'.

Due to the low number of negative responses, it is not possible to perform further statistical tests or provide more evidence. Therefore, it can be concluded from this low number those consumers are not interested in comparing the quality of products available abroad or foreign-produced products unless they have been informed by someone else. However, when asked directly about dual quality, they agree that the difference in quality is a problem. Rational consumers must consistently answer the question of whether they consider dual quality to be a problem. Disagreement would indicate irrational behaviour, which is, accepting and paying for inferior products.

Collected data presented in Figure 1 clearly shows that customers are much more interested in a wider selection of goods above fact that food products are imported. A frequency of 1.8% can be interpreted as a statistical deviation. As explained above answers contain mostly suggestive expressions with a very negative tone.

We recommend repeating the previously conducted research under new conditions. The consumer should not be aware that the research is focused on dual quality, especially when examining their opinions. In the case that the consumer is aware of the nature of the research, their reaction must be negative. A further condition for examining emotions related to purchases and the quality of products abroad is the separation of emotions that are unrelated to the quality of purchased items. It is quite likely that the consumer already has positive emotions in connection to the occasional trip abroad.

The single, unanswered question concerns the frequency of occurrences of dual quality and the reasons why it happens. The existence of dual quality is undoubted; however, it is not known whether the reason for it is due to cheap raw materials or the necessity to satisfy the local consumer preferences. The findings to date in the majority of cases have concerned only minor products.

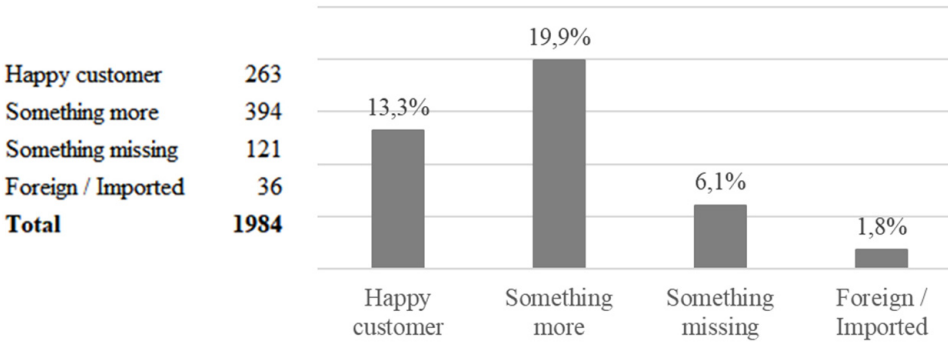

Figure 1. Respondents' interest in specific food quality

Source: own empirical research.

CONCLUSIONS

The sample survey of 1 984 respondents showed that 62% of consumers are willing not only to answer closed questions but also express their opinion with a written response. Satisfaction with quality or selection was directly expressed by 13% of consumers. A greater selection would appreciate 20% of consumers; however, at the same time, they would not complain about the quality. Only 36 respondents, which is less than 2% of the total number, mentioned foreign-produced products in their responses.

With regards to the results, which showed that respondents do not even consider comparing the quality of foreign-produced products, we recommend that a separate study be conducted to either support or refute this conclusion. At the same time, it would be interesting to compare the results of different research from a variety of member states in the European Union. When creating the questionnaire, special attention must be paid so as not to suggest answers to the respondent, for example, so that they are not aware that the research is focused on the dual quality of products.

A further recommendation is to support general education on the activities and competencies of European Union institutions. Our research has shown that respondents prioritize locally-made products, yet do not consider the question of dual quality to be of any interest. This does not correspond to the attention given to dual quality in the media or politics. The academic community can play a positive role in the education and contribution towards European integration, especially in cross-border cooperation.

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REFERENCES

1. Bartková, L. (2019). How do consumers perceive the dual quality of goods and their economic aspects in the European Union? An empirical study. Problems and Perspectives in Management, 17 (3), pp. 382-394.
2. Bartková, L., Sirotiaková, M. (2021). Dual quality and its influence on consumer behavior according to income. SHS Web of Conferences, 92, 06001. https://doi.org/10.1051/shsconf/20219206001
3. Bíreš, J. (2018). Výročná správa a verejný odpočet za rok 2017. Retrieved from: http://www.svps.sk/dokumenty/zakladne_info/VS_2017.pdf
4. Bureau Européen des Unions de Consommateurs – BEUC (2018). Dual Product Quality Across Europe: State-of-play and The Way Forward. Brussels. Ref: BEUC-X-2018-031. Retrieved from: https://www.beuc.eu/publications/beuc-x-2018-031_beuc_position_paper_on_dual_quality.pdf
5. Fromm, E. (1992). The anatomy of human destructiveness. Macmillan, London – New York.
6. Šajn, N. (2019). Dual quality of products – State of play European Parliamentary Research Service. European Parliament. Retrieved from: https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/644192/EPRS_BRI(2019)644192_EN.pdf
7. Šedík, P., Kňazovická, V., Horská, E., Kačániová, M. (2018). Consumer sensory evaluation of honey across age cohorts in Slovakia. Potravinarstvo Slovak Journal of Food Sciences, 12 (1), pp. 673-679.
8. Walker, A., Williams, J.B. (2017). Dual Quality Foodstuffs in Europe. Global Agricultural Information Network. GAIN Report E17039. Retrieved from: https://www.agriculturejournals.cz/publicFiles/307_2018-AGRICECON.pdf

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IMPORTANCE OF SOCIAL ENTREPRENEURSHIP IN PRESERVING NATURAL CAPITAL IN LATVIA

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ABSTRACT

With the increasing focus being placed on climate problems, the role of social entrepreneurship in the protection of nature and the environment becomes increasingly important in the world. The activities specified in the Sustainable Development Strategy of Latvia about the preservation of natural capital are performed by several social enterprises. The research aims to identify the role of social enterprises in performing the activities specified in the Sustainable Development Strategy of Latvia. The research has found that the Latvia 2030 strategy emphasizes the importance of fostering entrepreneurship about the preservation of natural capital as well as promoting sustainable lifestyle activities. The mentioned activities are relevant to social enterprises that are engaged in preserving and protecting the environment, as social entrepreneurs not only contribute to green entrepreneurship but also make significant investments in education and informing the public, as well as in the development of innovative entrepreneurship.

Key words: social entrepreneurship, sustainable entrepreneurship, environment

JEL codes: L31, Q01, Q50

INTRODUCTION

Because of rapid development in the early 2000s, social entrepreneurship has become a field of science for researchers and several shortcomings have been identified in the sector, such as lack of definition, legislative gaps, and fragmentation in the industry due to the lack of knowledge about the long-term effects (Sassmannshausen and Volkman, 2013; Macke et al., 2018). Social entrepreneurship involves identifying, assessing, and using business opportunities in a way that creates social value for meeting the basic and long-term needs of society (Austin, Stevenson and Wei-Skillern, 2006).

As the number of social enterprises in Latvia increases, the kinds of economic activity the enterprises are engaged in are captured by statistics. Most of 58% of the social enterprises are engaged in the fields of labour integration and education, while only 4% of them are engaged in environmental protection and nature preservation. Although the strategy Latvia 2030 sets out courses of action and activities for the preservation of natural capital, which also specify support for entrepreneurs performing this function, little is still known about the environment for social entrepreneurship. Social enterprises engaged in the preservation of natural capital represent various fields: clothing processing, zero-waste catering

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services, building management, and in addition, they tackle various socio-economic problems related to labour integration and regional and urban development (Līcīte, Perkune and Auziņa, 2020). The various innovative solutions developed locally by social entrepreneurs are often implemented not only regionally but also globally, thereby contributing to dealing with climate change impacts (Zahra et al., 2008).

In the European Union criteria for establishing social enterprise differs significantly, so European Commission publishes reports of 27 Member States about the county's situation in the field (European Commission, 2020). It should be emphasized that only two of the Member States, Denmark, and the Czech Republic, have included environmental factors in the development of social entrepreneurship in the country as well as given support instruments for developing this sector.

MATERIALS AND METHODS

The research aims to identify the role of social enterprises in performing the activities specified in the Sustainable Development Strategy of Latvia. The following specific research tasks were set: to perform an analysis of the Sustainable Development Strategy of Latvia (Latvia 2030) in the field of natural capital preservation; to perform an analysis of the environment for social entrepreneurship in the field of nature preservation; to determine which of the activities of the Latvia 2030 strategy could be performed by social enterprises engaged in environmental protection. The monographic and descriptive methods were used to make a theoretical discussion on strategy. Analysis and synthesis were employed to examine various elements of statistics on social entrepreneurship. Induction and deductions were used to identify causal associations and explain the data. The case study method was used to examine those social enterprises in Latvia whose priorities are related to nature preservation. The interview was used to identify challenges that face social entrepreneurs. In the expert interviews, three social entrepreneurs were selected using a targeted selection method: knowledge, work experience, relationship with the studied phenomenon (Babbie, 2005).

RESEARCH RESULTS AND DISCUSSION

The Sustainable Development Strategy of Latvia (Latvia 2030) sets the goal of sustainable management of natural values and services – 'to be the EU leader in the preservation, increase and sustainable use of natural capital'. The strategy stipulates that Latvia, as one of the 'greenest' and least urbanised territories of the EU, should become a model for the management of natural capital. A significant emphasis is placed on the fact that Latvia's forests absorb more CO_2 than its economy generates, as well as Latvia, is one of the leaders in the European Union in terms of biomass use and biodiversity, which indicates the good state of the ecosystem in the country (Latvia 2030, 2010).

The long-term courses of action set out in the strategy include: natural capital management, development of market instruments, capitalisation of natural assets, promotion of a sustainable lifestyle.

Natural capital management. It has been stressed that the current support programmes, market mechanisms, and policy strategies have not been effective in preserving natural capital; therefore, it is necessary to apply a management approach to natural capital risk assessment. Such an approach contributes to the sustainable management of natural resources through reducing pollution and waste flows, as well as ensuring the development of ecosystem services, which allows combining basic environmental and economic findings, thereby promoting the management of natural capital using economic decisions (Latvia 2030, 2010).

In natural capital management, the strategy plans to perform a comprehensive gap analysis of Latvia's natural capital and compare the current situation with the reference level. The analysis results could set long-term goals for the sustainable use, management, and protection of natural resources, as well as identify ecosystems needing restoration. This kind of analysis would serve as a basis for a natural capital development programme aimed at avoiding natural capital-related risks and ensuring the integration of development goals into other sectoral policies (Latvia 2030, 2010).

Development of market instruments. It would contribute to the eco-efficiency of the economy. The development of such instruments would lead to new

products and services that foster entrepreneurship (Latvia 2030, 2010).

Capitalisation of natural assets. It could be achieved through actively implementing business support policies and creating the image of Latvia as a 'green' country. This would contribute to the development of the export sector and the foundation of new enterprises and new industries (Latvia 2030, 2010).

Promotion of a sustainable lifestyle. The strategy emphasizes that climate change is largely driven by human economic activity and overconsumption, thereby leading to new threats to natural capital and adversely impacting the climate. To avoid threats to natural capital, the final consumer should be involved in preserving the ecosystem (Latvia 2030, 2010).

Although the strategy repeatedly emphasizes both the social factor and the environmental protection and natural capital preservation factor, it does not specify the promotion of social entrepreneurship about the environment. Supporting social entrepreneurship to deal with environmental problems could address the various challenges outlined in the strategy, including enhancing the entrepreneurial environment, fostering innovation, and stimulating the green economy.

The number of social enterprises in Latvia increases very fast. In 2018, 27 social enterprises were registered, in 2019 their number increased to 81, and 91 enterprises were registered as of 6 February 2020. Statistics from the Ministry of Welfare (MoW) show that 149 social enterprises were registered as of 31 January 2021 (Register of Social Enterprises, 2021).

Based on the MoW register of social enterprises and available statistics, it could be concluded that in Latvia, just like in other European countries, work integration represented the largest area of social entrepreneurship (24%) as well as education (24%). Environmental protection ranked last in Latvia, accounting for only 4%. For comparison – in Lithuania, there are 2.7% and in Estonia, 7% of social enterprises develop environmental protection, while in Denmark who's one of the priorities in this field, there are 29% of environmental social enterprises (European Commission, 2020).

The increase in the total number of social enterprises and environmental-related social enterprises (both primary and secondary objectives are environmental protection) since the establishment of the register of social enterprises in 2018 and the average growth rate are shown in Table 1.

Table 1. Increase in the number of social enterprises in the period 2018–2020

Indicators	2018	2019	2020	Average growth rate (%)
Number of social enterprises	27	81	142	137.6
Chain growth rate (%)	–	200.0	75.3	
Number of social enterprises related to environmental protection and nature preservation	1	5	5	200.0
Chain growth rate (%)	–	400.0	0.0	

Source: authors' compilation based on Register of Social Enterprises, 2021.

The enterprises whose priorities related to nature preservation and environmental protection were as follows: Café-M Ltd, Mans peldkostīms Ltd, Zīle-zīle Ltd, Social Supply Portal Ltd, and Free Riga house guardians Ltd. However, some other enterprises, e.g. Mammām un tētiem Ltd, Brīvā skola Ltd, Upeslīči atpūtai Ltd, Home 127 Ltd, OnPlate Ltd and Kalnciema iela Ltd have listed environmental protection as one of their goals, but not a priority (Register of Social Enterprises, 2021).

Café-M Ltd acquired social enterprise status on 25 September 2018 and is the oldest social enterprise in Latvia involved in environmental protection. According to the data of the Register of Social Enterprises, the goals of Café-M Ltd are as follows: (1) environmental protection and preservation: to create a cafe that does not produce waste (zero waste or waste-free); to educate the public on environmental protection and preservation problems; to educate the public on the possibilities of generating as little waste as possible to meet their daily needs, thereby reducing the environmental burden on the environment; (2) to educate the public on the recycling and reus-

ability of various kinds of waste; (3) to promote the consumption of environmentally friendly and healthy human food (Register of Social Enterprises, 2021). The enterprise is the first zero-waste cafe in Latvia, it composts the organic waste produced by the cafe, as well as takes various measures to promote an ecological lifestyle (Baumane, 2019).

Social Services Portal Ltd acquired social enterprise status on 1 March 2019 and aims to contribute to strengthening the social environment by making it possible to donate unnecessary things to people in need through an Internet platform. The main emphasis of the enterprise is put on environmental protection and the promotion of the circular economy in the field of waste reduction (Register of Social Enterprises, 2021).

My Swimwear Ltd acquired social enterprise status on 1 March 2019 and the enterprise's goal is to reduce plastic and clothing waste in Latvia. The enterprise produces swimsuits from recyclable waste. Swimsuits are sustainable – they can withstand both chlorinated pool water and saltwater, sun exposure, and washing. The enterprise packs its products in sustainable packaging (Register of Social Enterprises, 2021). Laura Žukovska-Supe, co-owner of the company, emphasizes that Latvia sees great challenges in the field of waste management and funds should be invested in it for Latvia to become a country of green innovation. She also emphasizes the shortcomings of regulatory enactments and the lack of financial support faced by social entrepreneurs, which prevents them from becoming serious market participants.

Free Riga house guardians Ltd acquired social enterprise status on 2 June 2019. The enterprise is engaged in offering abandoned buildings in Riga for various projects, in agreement with their owners, so that they have an opportunity to engage in creative activities while these buildings are not in use. The goal of Free Riga house guardians Ltd is to promote, organise and develop the management and socially responsible revitalisation of abandoned and unused buildings and territories by providing a development platform for cultural diversity, a civil society, education and skills development, volunteering, and cooperation between non-governmental organisations and the integration of socially and economically disadvantaged groups (Register of Social Enterprises, 2021).

Zīle-zīle Ltd acquired social enterprise status on 24 February 2020, and the social goal specified in the Register of Social Enterprises is: 'to reduce the amount of textile waste by creating new value-added products, as well as build up an awareness of resource reuse'. The enterprise uses recycled clothing that is purchased at a second-hand clothing store or received as a donation and creates new clothing designs (Register of Social Enterprises, 2021). In an interview, the company's founder Aiva Zīle admitted that one of the problems is attracting customers because the customers of this company are responsible, who do not buy new dresses every month. In addition, there would be a need to educate young people more in schools about upcycling design, as there is a lack of public awareness on social entrepreneurship.

Mammām un tētiem Ltd acquired social enterprise status on 20 June 2019. Although the main goal of the enterprise is to educate Latvian families on various matters, represent their interests, strengthen family values and improve demography, one of its fields is education on environmental problems. On the enterprise's website, entering keywords related to nature protection, it is possible to find various educational and informative articles on environmental problems, natural capital preservation, etc. (Register of Social Enterprises, 2021).

Brīvā skola Ltd acquired social enterprise status on 25 November 2019 – it is a school, one of the basic values of which is nature. The main field of activity of the enterprise is education, and its goal directly relates to educational activities, with a great emphasis being placed on the promotion of a healthy, environmentally friendly lifestyle, education about climate change, and raising awareness of human-environment interactions (Register of Social Enterprises, 2021).

Upeslīči atpūtai Ltd is a guest house that has acquired social enterprise status on 24 January 2020 and is engaged in the sustainable development of rural tourism, using all kinds of resources rationally. The enterprise's website does not contain information on issues related to the sustainable development of natural resources (Register of Social Enterprises, 2021).

Home 127 Ltd acquired social enterprise status on 30 April 2020. Its field of activity is the operation of Internet portals as indicated in the Register of Social Enterprises, and the goal of the enterprise is to carry out general educational activities on environmental sustainability, healthy lifestyles, as well as to employ target groups. The enterprise's website was inactive (Register of Social Enterprises, 2021).

OnPlate Ltd acquired social enterprise status on 24 July 2020 and promotes healthy eating habits, combats public delusions, pseudoscience, promotes environmentally-friendly lifestyles, and develops various projects, including ones related to environmental protection. The enterprise is managed by a team of medical professionals – nutritionists (Register of Social Enterprises, 2021). In an interview with OnPlate, Tatjana Topo emphasizes that the company faces various personal challenges, and it is important to create low impact, take small steps to promote climate change in a positive direction.

Kalnciema iela Ltd acquired social enterprise status on 22 October 2020, and one of the enterprise's goals is to 'conduct anti-pollution activities, including the reduction and sustainable use of food and other waste'. There is no information on the enterprise's website about such activities (Register of Social Enterprises, 2021).

Examining social enterprises in Latvia and the Latvia 2030 strategy, it could be concluded that several activities specified in the strategy pertained to social enterprises, e.g. a green budget reform involving tax incentives for sustainable social enterprises; natural asset capitalisation activities stimulating green entrepreneurship, support for knowledge transfer and support programmes for the development of innovative entrepreneurship; as well as activities aimed at promoting sustainable lifestyles, including engaging social enterprises in environmental education programmes, building up households' awareness and certifying sustainable products.

One of the problems associated with research on social entrepreneurship from an environmental perspective is that not all enterprises that perform a social function about nature and environmental protection are registered in the Register of Social Enterprises. For example, enterprises such as the association 'TUVU', which is engaged in charity, helping to find new owners for second-hand goods, or dishes and interior items created by designer Ingus Gustavsons from used glass jars (Latvian designer creates..., 2017; Who are we, s.a.).

CONCLUSIONS

The Sustainable Development Strategy of Latvia emphasizes natural capital preservation activities, yet no specific proposals have been developed on how to implement the activities.

Although the number of social enterprises in Latvia increases fast, social enterprises related to environmental protection account for only 4% of their total number.

The largest problem in environmental social entrepreneurship is the identification of enterprises that are engaged in environmental protection and perform a social function, yet for some reason have not registered as social enterprises.

The research hypothesis proved to be true – social entrepreneurship performs the function of preserving natural capital, as social enterprises related to environment protection correspond to several activities referred to in the Latvia 2030 strategy, yet the promotion of social entrepreneurship in the environmental context is not incorporated in the strategy.

REFERENCES

1. Austin, J., Stevenson, H., Wei-Skillern, J. (2006). Social and commercial entrepreneurship: Same, different, or both? Entrepreneurship Theory and Practice, 30 (1), pp. 1-22. https://doi.org/10.1111/j.1540-6520.2006.00107.x
2. Babbie, E.R. (2005). The basics of social research. Thomson/Wadsworth, Belmont, CA.
3. Baumane, L. (2019). Baltijā pirmās 'zero waste' kafejnīcas vadītāja Ulla Liz sevis grab atstāt sasniegumus, nevis atriums [Ulla, the manager of the first 'zero waste' cafe in the Baltics, wants to leave behind achievements, not waste]. Retrieved from: https://www.lsm.lv/raksts/zinas/ekonomika/baltija-pirmas-zero-waste-kafejnicas-vaditaja-ulla-aiz-sevis-grib-atstat-sasniegumus-nevis-atkritumus.a337773 [accessed 14.12.2020].

4. European Commission (2020). Social enterprises and their ecosystems in Europe. Retrieved from: https://ec.europa.eu/social/main.jsp?pager.offset=0&advSearchKey=socnteco&mode=advancedSubmit&catId=22&doc_submit=&policyArea=0&policyAreaSub=0&country=0&year=0 – [accessed 28.04.2020].
5. Kas mēs esam [Who are we] [s.a.]. Retrieved from: http://www.biedribatuvu.lv/par-mums [accessed 11.12.2020].
6. Latviešu dizainers rada… [Latvian designer creates…] (2017). Retrieved from: https://jauns.lv/raksts/skaistums/246542-latviesu-dizainers-rada-unikalus-traukus-no-trislitru-gurku-burkam [accessed 11.12.2020].
7. Latvija 2030. Latvijas ilgtspējīgas attīstības stratēģija līdz 2030.gadam [Latvia 2030. Sustainable Development Strategy of Latvia until 2030] (2010). Retrieved from: https://www.pkc.gov.lv/sites/default/files/inline-files/Latvija_2030_7.pdf [accessed 20.11.2020.
8. Līcīte, L., Perkune, L., Auziņa, A. (2020). Role of Social Entrepreneurship in Tackling Environmental Problems. 20th International multidisciplinary scientific GeoConference SGEM 2020, 20 (5.2), pp. 431-438.
9. Macke, J., Sarate, J.A.R., Domeneghini, J., da Silva, K.A. (2018). Where do we go from now? A research framework for social entrepreneurship. Journal of Cleaner Production, 183, pp. 677-685. https://doi.org/10.1016/j.jclepro.2018.02.017
10. Sassmannshausen, S.P., Volkmann, C. (2013). The Scientometrics of Social Entrepreneurship and Its Establishment as an Academic Field. Journal of Small Business Management, 56 (2), pp. 251-273. https://doi.org/10.1111/jsbm.12254
11. 11. Sociālo uzņēmumu reģistrs [Register of Social Enterprises] (2021). Retrieved from: https://www.lm.gov.lv/lv/socialo-uznemumu-registrs [accessed 03.02.2021].
12. Statistikas dati par… [Statistics on…] (2021). Retrieved from: https://www.lm.gov.lv/sites/lm/files/media_file/statistika_su_31012021.pdf [accessed 02.02.2021].
13. Zahra, S.A., Rawhouser, H.N., Bhawe, N., Neubaum, D.O., Hayton, J.C. (2008). Globalization of social entrepreneurship opportunities. Strategic Entrepreneurship Journal, 2 (2), pp. 117-131. https://doi.org/10.1002/sej.43

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HEALTHY AND INNOVATIVE FOOD VERSUS SLOVAK CONSUMER

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ABSTRACT

Consumers are becoming more conscious of the necessity of consuming nutritious food and opting for healthier, more functional food. We consider healthy food with functional benefits to be innovative food. The purpose of the research reported in the paper is to determine the variations in consumer perceptions of rational eating in the Slovak Republic. Even though 48.77% of respondents in the Slovak Republic eat everything and are not interested in rational eating, 43.50% follow it. The study aims to divide customers into groups (way of eating) and identify differences in rational eating perceptions based on gender, the location where they live, level of education, economic status, and net income.

Key words: healthy food, functional food, rational eating

JEL code: M31

INTRODUCTION

Healthy eating patterns belong to actual market trends and the current lifestyle of many people. Consequently, it is also a challenging area of interest for food producers, wholesalers, and retailers. They are motivated by changes in eating habits, availability of new ingredients, environmental and medical issues as well. Access of Europeans to healthy, affordable, and sustainable food has become one of the goals of the European Green Deal within the policy area 'From farm to fork'. To design recommendations for the food industry and trade, first, we need to know how people behave and what the consumer perception towards healthy and innovative food is as we set in the second aim of the study – to identify differences in rational eating perceptions based on gender, the location where they live, level of education, economic status, and net income.

THEORETICAL BACKGROUND

In recent years, both customers and food producers have been increasingly interested in nutritious food. They are both equally interested in identifying the factors that influence the perception of healthfulness.

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Most young consumers are not interested in ensuring proper food safety (Franc-Dąbrowska et al., 2021). At the same time, innovativeness can be considered a strategic tool to improve their market position for agro-food companies (Moravčíková, Tkáč and Mušinská, 2021), however, most farmers claim that they intend to continue their organic production only if financial support is provided (Łuczka and Kalinowski, 2020). Determining which meals are healthful may be a challenge (Motoki et al., 2021). There are no objective criteria for what defines healthy food, it is sometimes characterised as food that is high in nutrients (e.g. low in calories, sodium, and saturated fat) (Lobstein and Davies, 2008). People's food purchasing decisions are influenced by their perceptions of healthfulness (Motoki et al., 2021). In this regard, seeking answers to the following questions on consumer attitudes toward innovative and functional foods should be the first step. In the research of Gutkowska and Czarnecki (2020) we find three logically related research questions:

- What do customers think of phrases like 'innovative food product' and 'functional food', and what changes do they notice in the food industry? (Component of knowledge).
- What is the public's perception of the food market's recent developments, as well as a creative and functional food and its purchase? (Component of emotion).
- How do customers react to new and functional food items, or how do they intend to react?

Ingredients, product category (e.g. vegetable, meat, honey), packaging, nutritional labels, food origin, added health benefits associated with eating specific foods are all factors that influence people's perceptions of healthy food (Plasek, Lakner and Temesi, 2020). As an example of a healthy and innovative product, we can mention 'honey' with spices, herbs, dried fruits, pollen, and propolis (Šedík, Pocol and Ivanišová, 2020).

MATERIALS AND METHODS

Data about rational eating comes from the questionnaire survey 'Consumer survey for healthy and functional foods'. The survey was attended by 1 189 respondents living in the Slovak Republic, who were randomly selected. Chi-square test was used to find a statistically significant difference between factors if theoretical counts were more than 5 and Fisher's test if theoretical counts were lower than 5 in contingency tables. We used the XL stat and Microsoft Excel to evaluate the results.

We set hypotheses to find answers concerning approaches to eating and rational eating:

- H1: There is no statistically significant difference in approaches to eating between women and men.
- H2: There is no statistically significant difference in approaches to eating between living in town and village.
- H3: There is no statistically significant difference between women and men in terms of rational food.
- H4: There is no statistically significant difference between the respondents living in the city and village in terms of rational food.
- H5: There is no statistically significant difference between the levels of education of the respondents in terms of rational food.
- H6: There is no statistically significant difference between the economic positions of the respondents in terms of rational food.
- H7: There is no statistically significant difference between the net monthly incomes of the respondents in terms of rational food.

RESEARCH RESULTS AND DISCUSSION

The first question 'Which group of consumers does you belong to' shows that the biggest part of respondents (48.77%) consumes everything, and they do not deal with rational food as is described in Figure 1. Another big group of respondents (43.50%) prefers balanced food (rational eating) – this main group of consumers, we will deal with further in the paper.

Only 1.67% of consumers consume mostly fast food and semi-finished products, 4.22% are flexitarians, so they reduce the consumption of meat and meat products, 1.05% are vegetarians, and only 0.7% are vegans. There are statistically significant differences in approaches to eating between women and

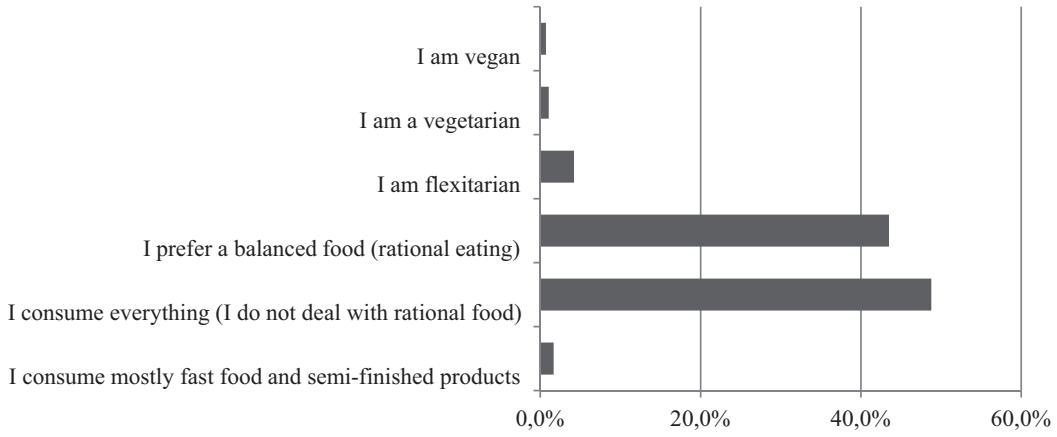

Figure 1. Distribution of the consumer's group

Source: own empirical research.

men because *p*-value was lower than 0.0001, we reject H1. Differences in food consumption by gender are shown in Figure 2. Based on the above, we can say that men consume mostly fast food and semi-finished product more than women. It follows that women eat more rationally than men – women reduce the consumption of meat and meat products, there are more women vegetarian and vegan than men.

A *p*-value lower than 0.0002 rejected H2, so we also can say, that people living in town and village have different attitudes towards eating groups. People living in the city consume fast food and semi-finished product more than people living in a village. People living in a village grow their vegetables and fruits and keep farm animals because they have their gardens. There are more flexitarians in the village, but vegans and vegetarians are more represented in cities. People living in a village prefer balanced food a little more than people living in a city.

From the point of view of rational eating, we have a total of 495 respondents eating rationally: 57.65% women and 42.35% men. City dwellers account for 47.88% of respondents and villagers for 52.12%. By Chi-square test we statistically proved differences

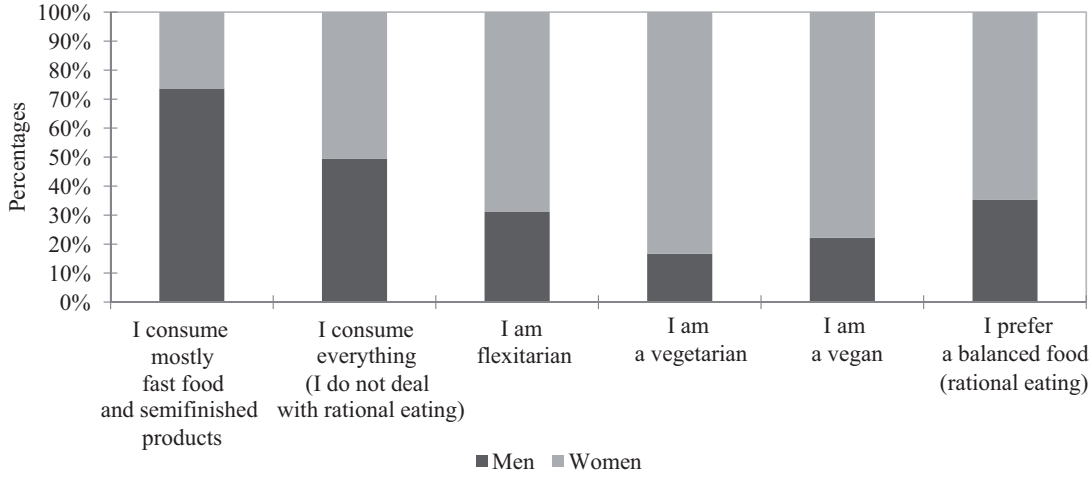

Figure 2. Differences in food consumption by gender

Source: own empirical research.

between women and men in terms of rational food, *p*-value 0.01, so we reject H3. Differences in rational eating by the place where respondents come from have been confirmed by the Chi-square test, *p*-value was lower than alpha (0.01), so there is a statistically significant difference between the respondents living in the city and village in terms of rational food and we reject H4. People living in a village are interested in rational eating less than people living in a city. From the perspective of the level of education of respondents, we reject H5 ($p < 0.001$), so there is a statistically significant difference between the level of education of the respondents in terms of rational food as Figure 3 shown. People with higher education prefer rational eating the most and people with basic education the least. Secondary education people (without the general certificate of secondary education – GCSE) and respondents with basic education do not prefer rational eating as much as respondents with GCSE and higher/vocational education.

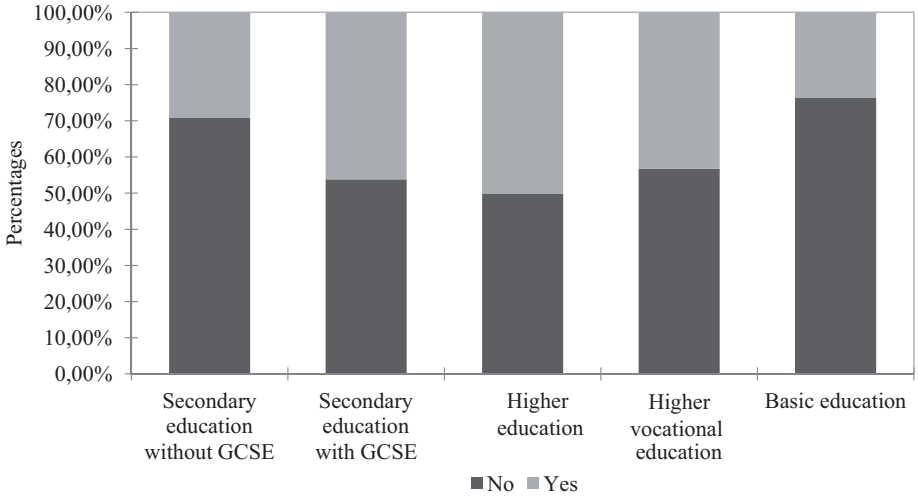

Figure 3. Differences in evaluation based on the level of education of the respondents in terms of rational eating

Source: own empirical research.

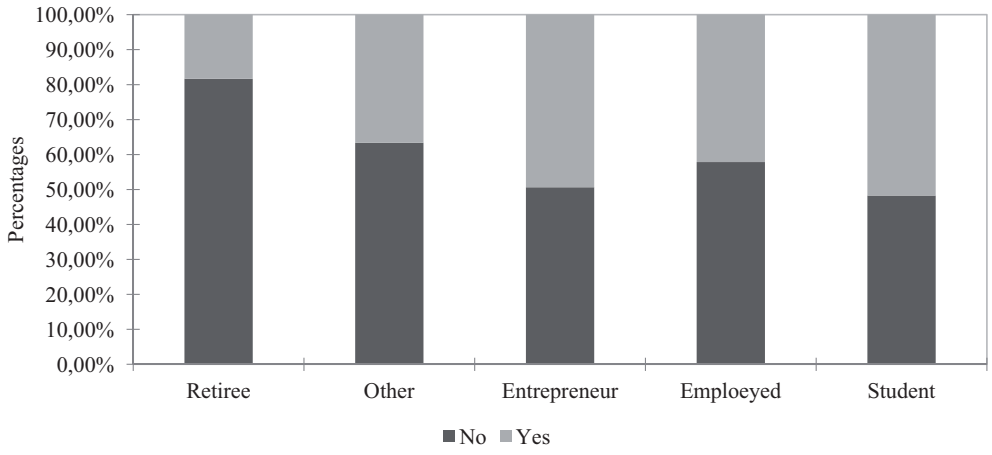

Figure 4. Differences in evaluation based on the economic position of the respondents in terms of rational eating

Source: own empirical research.

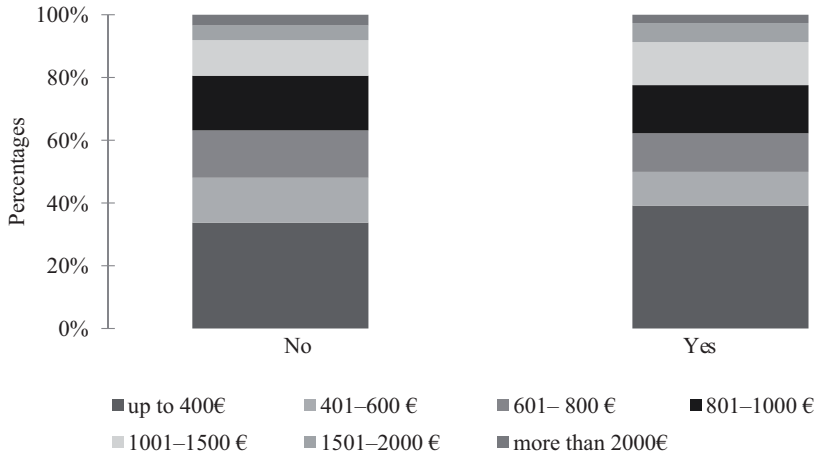

Figure 5. Differences in evaluation based on the net monthly income of the respondents in terms of rational eating

Source: own empirical research.

Figure 4 shows the differences in the perception of rational eating in terms of economics position which confirms the Chi-square test with a *p*-value (0.0001) lower than alpha, so we reject H6. Retirees are the least attached to rational eating, on the other side students are the most attached. Employed people marked the answer 'No' more than the answer 'Yes' and entrepreneurs evaluated these factors in the same way.

The last hypothesis H7 was accepted. There is no statistically significant difference between the net monthly incomes of the respondents in terms of rational food as you can see in Figure 5. By Chi-square test *p*-value (0.113) is greater than the significance level alpha (0.05).

CONCLUSION

Following the questions by Gutkowska and Czarnecki, 61.16% of respondents know what is 'innovative or functional' food. They consider these foods to be healthier and better, but more expensive. As for the changes, they are noticing more organic foodstuff in stores. The biggest part (48.77%) of all consumers in Slovakia are consumers which consume everything (do not deal with rational eating). The second, but very important part (43.5%) is made up of consumers which prefer balanced food. Women are more vegetarians and vegan; they reduce consumption of meat and meat products more than men. Men consume mostly fast food and semi-finished product more than women. People living in the city consume fast food and semi-finished product more than people living in the village – because they have, they own gardens. In the Slovak Republic, more flexitarians are living in the village, but vegans and vegetarians are more represented in cities. In general, people living in the village prefer balanced food a little less than people living in the city. From the point of view of rational eating in the Slovak Republic, women prefer rational eating more than men. People with higher education prefer rational eating the most and people with basic education the least. Retirees are the least attached to rational eating, on the other side students are the most attached. No differences were found in the Slovak Republic in terms of the net monthly income.

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REFERENCES

1. European Commission (2020). Questions and Answers: Farm to Fork Strategy – building a healthy and fully sustainable food system. Retrieved from: https://ec.europa.eu/commission/presscorner/api/files/document/print/en/qanda_20_885/QANDA_20_885_EN.pdf
2. Franc-Dąbrowska, J., Ozimek, I., Pomianek, I., Rakowska, J. (2021). Young consumers' perception of food safety and their trust in official food control agencies. British Food Journal, 123 (8), pp. 2693-2704. https://doi.org/10.1108/BFJ-11-2020-0992
3. Gutkowska, K., Czarnecki, J. (2020). Consumer Attitudes Towards Innovative Food Products Including Functional Products – Implications for Marketing in Terms of Nutrition and Health Claims. Marketing of Scientific and Research Organizations, 38 (4), pp. 107--128. https://doi.org/10.2478/mini-2020-0029
4. Lobstein, T., Davies, S. (2009). Defining and labeling 'healthy' and 'unhealthy' food. Public Health Nutrition [online], 12 (3), pp. 331-340. https://doi.org/10.1017/S1368980008002541
5. Łuczka, W., Kalinowski, S. (2020). Barriers to the Development of Organic Farming: A Polish Case Study. Agriculture, 10, 536. https://doi.org/10.3390/agriculture10110536
6. Moravčíková, D., Tkáč, F., Mušinská, K. (2021). Selected Aspects and Determinants of the Slovak Agro--Food Companies' Innovativeness. Frontiers in Sustainable Food Systems, 5, 720730. https://doi.org/10.3389/fsufs.2021.720730
7. Motoki, K., Park, J., Pathak, A., Spence, Ch. (2021). Constructing healthy food names: On the sound symbolism of healthy food. Food Quality and Preference [online], 90. https://doi.org/10.1016/j.foodqual.2020.104157
8. Plasek, B., Lakner, Z., Temesi, A. (2020). Factors that Influence the Perceived Healthiness of Food – Review. Nutrients [online], 12 (6), 1881. https://doi.org/10.3390/nu12061881
9. Šedík, P., Pocol, B.C., Ivanišová, E. (2020). Interdisciplinary Approach Towards Consumer Acceptability of Flavoured Honey: Case of Young Generation in Slovakia. Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. Food Science and Technology [online], 77 (2), pp. 57-66. https://doi.org/10.15835/buasvmcn-fst:2020.0039

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METHODOLOGY FOR ESTIMATION THE EFFICIENCY OF AGRICULTURAL LAND IN RUSSIAN FEDERATION

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ABSTRACT

Paper devoted estimation of the efficiency of agricultural land in the Russian Federation. Land is the main production factor in agriculture, hence it is important to know the effective usage of land. Land efficiency could be evaluated in different ways. In this paper, it was suggested to use as factors – feed units received from 1 ha arable land, amount of growing production in fair price in 1 ha, gross and net profit per 1 ha. Also, methodology suggested calculating potential yield and the potential cost of arable land, using a score of soil quality. The paper aims to suggest a methodology of economic efficiency. Case study base on agricultural company Kolos, Russia.

Key words: land assets, economic efficiency, ecological efficiency, criteria, methods, soil quality
JEL code: Q12

INTRODUCTION

The land is a main agricultural production facility and a primary spatial base for the production of material benefits. The specific features of the land which differ it from the other agricultural means of production are:

- land is utilised as an instrument of labour and an object of labour simultaneously;
- irreplaceability with other means of production;
- land is the basis of agriculture which intertwines the economic reproduction process and biological and natural ones;
- multiple usages of the same plot of land for making biological assets (plants) etc.

Lands, utilised in agriculture, are considered commercial ones and they comprise tilled fields, grasslands, hayfields, cattle run, lands for perennial plantings, lands for artificially impounded bodies in pond-fish farming (Alborov, Kontsevaya and Kontsevoy, 2020). The owners of these commercial lands get economic benefits represented by crops and for this reason, commercial lands may be considered land assets. These assets will bring sufficient benefits if they are used efficiently. Efficient land use is part of the country's food security (Ostaev et al., 2021).

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The efficiency of utilisation of land assets or agricultural lands depends on many factors but the main one of them is the establishment of appropriate land utilisation that comprises the creation of a local base for land cleanup, improvement of farming standards, and productivity of agricultural commercial lands, complete and reasonable utilisation of each type of commercial lands and rational arrangement of agricultural production.

Agricultural land estimation devoted plenty of research papers. Antropov and Komarov (2018) suggested to divide agricultural land into clusters according to economic efficiency. They suggested using factors as wheat harvest per 1 ha, amount of contracts for rent and sale, rent fee, and amount of tax. Svitin (2019) in his book argues that the main factor with influence land management is the level of technology, international conventions, and agreements, land policy inside the country. Lerman and Shagaida (2007) mention that Russia has a specific problem in the land market as high level of bureaucracy, corruption, and unclear procedures for land trading.

Wallace and Williamson (2007) mention that countries with developed markets create opportunities for commodification unrestrained by the volume of available land. The multiplication of land interests and layering of opportunities create the virtually unlimited potential for secondary and derivative markets.

Despite the common socialistic past of Russia and Poland, Poland has a significant important difference from Russia – the tradition of private ownership. Marks-Bielska (2013) mentions in the research that even under a command and quota system, private ownership was the dominant form of ownership. However, Poland has a similar problem with agricultural land to Russia. Despite the governmental effort and agricultural land protection, there is a huge loss of agricultural and forest land that is converted to other uses (Kurowska et al., 2020).

Sources of data for analysis could be the agricultural accounting statements of the farm (Kubascikova et al., 2019), internal documents, statistical data of soil fertility.

The paper aims to suggest a methodology of economic efficiency. Case study base on agricultural company Kolos, Russia.

MATERIALS AND METHODS

Efficiency extent of agricultural land utilisation depends on unconditional execution of all agrobiological and technologic procedures of manufacturing of the agricultural products on these lands, strict fulfilment of preliminary developed and introduced systems of crop rotation, fertilizers, active-adaptive technologies of cultivation of agricultural plants, gathering, transportation, storage and utilisation of obtained agricultural products.

To estimate agricultural land utilisation efficiency, an indicator framework is offered. Its indicators should be integral elements of land utilisation management in agriculture.

These indicators are reasonably subdivided into four groups in Table 1: (1) common indicators of land utilisation efficiency, (2) indicators of economic efficiency of land utilisation, (3) indicators of ecological efficiency of land utilisation, (4) indicators of crop production area utilisation (Bodrikova, Kontsevoy and Shlyapnikova, 2020, Knyazeva et al., 2020).

RESEARCH RESULTS AND DISCUSSION

The efficiency of utilisation of agricultural lands depends on the reclamation level of overall land area and plowed of commercial lands:

a) Reclamation level of overall land area by an agricultural company:

$$reclamation_j = \frac{land\ agricultural_j}{land\ total_j}, \quad (1)$$

where:

reclamation – coefficient of reclamation of overall land area (%),

land agricultural – an area of agricultural lands, i.e. arable land, pastures (ha),

land total – an overall area of lands belonging to the company (ha).

Table 1. Indicators of utilisation efficiency of agricultural lands

1. Common indicators of land utilisation efficiency	2. Indicators of economic efficiency of land utilisation	3. Indicators of ecological efficiency of land utilisation	4. Indicators of crop production area utilisation
1.1. Gross output by types of products (hwt) 1.2. Gross output by types per 100 ha of tilled field: (a) in hwt; (b) in RUB 1.3. Production measured by fair value or by transfer price per 100 ha of commercial land (RUB) 1.4. Productiveness of 1 ha of hay fields and cattle run (hwt) 1.5. Total productiveness, hwt of fodder unit from 1 ha of: (a) commercial land (b) tilled field	2.1. Gross output per 1 employee in crop farming: (a) in hwt; (b) in RUB 2.2. Production of specific kinds of products per 1 employee in crop farming (hwt) 2.3. Gross output estimated at transfer price per 1 person-hour (RUB) 2.4. Return on assets ratio – production is estimated at transfer price per average annual value of capital stock in crop farming (RUB) 2.5. Material productivity – production is estimated at transfer price per average annual value of the standard stock (RUB) 2.6. Land productivity (RUB) 2.7. Energy sustainability index per 1 ha of crop production area	3.1. Capital/output ratio – the opposite value of return on assets ratio (RUB) 3.2. Materials – output ratio – the opposite value of material productivity (RUB) 3.3. Labour intensity of production of specific types of products (person-hour) 3.4. Expenditure of specific types of material resources in physical units: (a) per 1 ha of crop production area; (b) per production 1 hwt of product 3.5. Total energy consumption per 1 ha of crop production area (thou. MJ) 3.6. Resource and energy consumption of fodder from 1 ha of fodder production area (thou. MJ) 3.7. Land consumption (RUB)	4.1. Profit margin from 1 unit of crop production area (RUB): (a) in commercial output production (b) in fodder production 4.2. Profit from 1 unit of crop production area (RUB): (a) in commercial output production; (b) in fodder production 4.3. Production costs per 1 ha of crop production area (RUB) 4.4. Crop yield of plants from 1 ha of crop production area (hwt) 4.5. Energy yield in the crop from 1 ha of crop production area (thou. MJ)

Source: own study.

b) Plowed level of agricultural commercial lands:

$$ploughness_j = \frac{land\ arable_j}{land\ agricultural_j}, \quad (2)$$

where:
ploughness – plowed level of agricultural commercial lands (%),
land arable – arable land for the cultivation of arable crops (ha),
land agricultural – an area of agricultural lands, i.e. arable land, pastures (ha).

c) Coefficient of the utilisation of tillable lands that is the extent of involvement of these lands into agriculture:

$$TU_j = \frac{land\ arable_j}{land\ tillable_j}, \quad (3)$$

where:
TU – coefficient of utilisation of tillable lands (%),
land arable – arable land for the cultivation of arable crops (ha),
land tillable – agricultural land, which can potentially be bearable.

To calculate such indicators as land productivity and land consumption, an agricultural company should define (establish) in-house (economic) price of a given type of agricultural land using a formula (Kontsevoy, 2016):

$$internal\ cost_j = (length \cdot feed\ unit \cdot oats\ price) + \\ + improvement, \quad (4)$$

where:
internal cost – in-house operation (economic) price of 1 ha of a given plot of land: tilled field, cattle run, grassland, hayfield (RUB),

length – suggested duration of the efficient (productive) period of the natural fertility of a given plot of land (tilled field, cattle run, grassland, hayfield) under the extensive condition of its utilisation (without fertilizer treatment, liming of soil, erosion-preventing activities, etc.) (years),

feed unit – output of all types of products (main, joint-cost, and secondary products) from 1 ha estimated in fodder units over 3–5 years averagely (hwt of fodder units),

oats price – market (sales) price of 1 hwt of oat in a farm unit over an accounting period (RUB),

improvement – total costs for recultivation (melioration) of soil estimated per 1 ha of a given plot of land (RUB).

Estimation of commercial land utilisation efficiency may be fulfilled by the integrated index of efficiency:

$$itegrated\ land\ use\ efficiency = \frac{harvest_j}{land_j}, \quad (5)$$

where:

integrated land-use efficiency – total amount of output (obtained) of crop farming products estimated by fair value (thou. RUB),

harvest – sum of all produced agricultural products of crop production at fair value (thou. RUB),

land – area of commercial land in a farming unit (ha).

The integrated index of efficiency should be analysed dynamically. As it is seen in Table 2 integrated indicator of the efficiency of commercial lands in a farming unit tends to decrease. Hence, management and leading specialists should pay much attention to the improvement of land utilisation, increase soil fertility with the introduction of adaptive landscape-specific agriculture.

One of the methods to increase land utilisation efficiency in agricultural companies (farming units) is including unused lands into agricultural activity, improvement of natural utilised lands, and increasing fertility.

Commercial land areas may be increased by recultivation of scrublands and transferring previously used lands to commercial ones. The other way to improve the utilisation of lands is improving the quality and fertility of soils of commercial lands including tilled fields.

Among the abovementioned indicators, field size should be highlighted especially as its shape influences the utilisation of modern agricultural equipment and tools.

The efficiency of tilled land utilisation and other commercial lands may be estimated by gross profit and net profit from 1 ha and total area:

$$gross\ profit\ per\ ha = \frac{\sum fair\ value_j - direct\ cost_j + general\ cost_j}{arable\ land_j}, \quad (6)$$

where:

gross profit per ha – gross profit from 1 ha of tilled field (RUB),

Σ*fair value* – the amount of fair value of totally obtained products (including secondary products) of all agricultural plants (thou. RUB),

direct cost – the number of direct costs (excluding salary budget) of plant production (RUB),

Table 2. Estimation of utilisation efficiency of agricultural lands on agricultural company Kolos, Russia in the period 2017–2019

Indicator	2017	2018	2019	2019 in % of 2017
Gross output of crop production estimated by fair value (thou. RUB)	125 568	92 758	95 956	74.4
Area of commercial land (ha)	5 728	5 728	5 728	100.0
Integrated indicator of efficiency (thou. RUB)	21.9	16.2	16.8	76.7

Source: own calculation.

general cost – the total amount of general production cost and general business cost of crop farming (RUB),
arable land – area of a given type of commercial land (ha).

$$net\ profit\ per\ ha = \frac{gross\ profit\ per\ ha_j - salary_j}{arable\ land_j}, \quad (7)$$

where:
net profit per ha – net profit from 1 ha of arable land (RUB),
salary – salary budget including social expenditures in crop farming (RUB),

The above-mentioned indicators may be calculated per 1 ha of the cultivated area of specific kinds and types of agricultural plants regarding water quality.

So, efficiency estimated by net profit from 1 ha of the cultivated area of grain crops may be calculated according to the following equation:

$$net\ profit\ land_j = BP \cdot B\left(FV - PC\right), \quad (8)$$

where:
net profit land – net profit from 1 ha of grain crop fields (RUB),
BP – the price of 1 score of soil quality of the given area of crop estimated by crop yield of grain crops (hwt),
B – quality score attributed to given cropland in an agricultural company (scores),
FV – fair value of 1 hwt of grain in farming unit,
PC – the prime cost of 1 hwt of grain in farming unit (RUB).

The efficiency of land utilisation in agricultural companies depends on many internal and external factors which are used for system analysis and results of this analysis help take scientifically based, reasonable, and prompt, and strategic decisions on land utilisation. Such factors as improvement of technical equipment and large-scale mechanisation of land processing, implementation of modern technologies of plant cultivation; introduction of fertility increasing activities; improvement of quality of production resources (machinery, seeds, fertilizers, etc.); rational utilisation of material and labour resources in crop farming; implementation of modern types of job arrangement and labour remuneration; observation of scientifically based systems of crop rotation and fertilizer treatment, etc. can be used for system analysis.

Estimation of land assets utilisation is recommended to fulfil in the agricultural company by comparison with leading companies and potential indicators should be established:

a) Crop yield of a plant from 1 ha (hwt):

$$potential\ yield_j = price_j \cdot score, \quad (9)$$

where:
potential yield – potential crop yield of a plant from 1 ha in a compared group of farming units,
price – the price of 1 score of estimation of soil quality by crop yield in leading (top) farming units (hwt),
score – average score of estimation of soil quality in a compared group of farming units.

b) Prime cost of 1 hwt of agricultural plant crop:

$$potential\ cost_j = PSQ_j \cdot score, \quad (10)$$

where
potential cost – the potential prime cost of 1 hwt of plant crop in a compared group of farming units (RUB),
PSQ – the price of 1 score of estimation of soil quality by production costs of 1 hwt of plant crop in the leading group of farming units (RUB),
score – average score of estimation of soil quality in a compared group of farming units.

c) Utilisation of capabilities of tilled field estimated by crop yield:

$$utilization = \frac{potential\ yield_j}{actual\ yield_j}, \quad (11)$$

where:

utilisation – level of utilisation of capabilities of tilled field estimated by crop yield from 1 ha in a compared group of farming units (%),

potential yield – potential crop yield from 1 ha (hwt),

actual yield – actual crop yield from 1 ha (hwt).

CONCLUSIONS

Practical application of the abovementioned indicators provides a high extent of objectivity, authenticity, and reliability of estimation and analysis of agricultural land utilisation efficiency in any agricultural company. Such estimation and analysis of land utilisation efficiency should be made to obtain relevant information in the system of land management and utilisation in agricultural companies.

This methodology can be used for management purposes in agricultural companies. It is easy to use and can be used in any agricultural company without additional training. The methodology was approbated on agricultural company Kolos, Russia.

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REFERENCES

1. Alborov, R., Kontsevaya, S., Kontsevoy, G. (2020). Assessment of productivity and profitability of land assets (lands), Management of the efficiency of land resources. In: Materials of the II National Scientific and Practical Conference on March 16, 2020. Izhevsk State Agricultural Academy Publishing House, Izhevsk, pp. 3-8.
2. Antropov, D., Komarov, S. (2018). Analysis of the effectiveness of land management in the region based on the application of the methodology of complex (cluster) zoning of territories (on the example of agricultural land). International Agricultural Journal Mezhdunarodnyy selskokhozyaystvennyy zhurnal, 5, pp. 16-19. https://doi.org/10.24411/2587-6740-2018-15069
3. Bodrikova, S., Kontsevoy, G., Shlyapnikova, A. (2020). Environmental efficiency of land assets in agriculture. Management of the efficiency of land resources. Materials of the II National Scientific and Practical Conference on March 16, 2020, Izhevsk State Agricultural Academy Pubfishing House, Izhevsk, pp. 79-83.
4. Knyazeva, O., Zobin, O., Antonov, E., Zakharova, P. (2020). Methodological aspects of assessing the social efficiency of the use of land assets. Management of the efficiency of land resources. In: Materials of the II National Scientific and Practical Conference on March 16, 2020. Izhevsk State Agricultural Academy Publishing House, pp. 161-166.
5. Kontsevoy, G. (2016). Razvitiye upravlencheskogo ucheta i kontrolya biologicheskikh i sovokupnykh zatrat v selskom khozyaystve [Development of management accounting and control of biological and total costs in agriculture]. Krasnodar [printed as manuscript].
6. Kubascikova, Z., Tumpach, M., Juhaszova, Z., Turebekova, B., Saparbayeva, S. (2019). Contextual Non-financial Information Analysis of Annual Reports. In: 16th Annual International Scientific Conference on European Financial Systems, pp. 334-344.
7. Kurowska, K., Kryszk, H., Marks-Bielska, R., Mika, M., Len, P. (2020). Conversion of agricultural and forest land to other purposes in the context of land protection: evidence from Polish experience. Land Use Policy, 95, 104614. https://doi.org/10.1016/j.landusepol.2020.104614
8. Lerman, Z., Shagaida, N. (2007). Land policies and agricultural land markets in Russia. Land Use Policy, 24 (1), pp. 14-23. https://doi.org/10.1016/j.landusepol.2006.02.001
9. Marks-Bielska, R. (2013). Factors Shaping the Agricultural Land Market in Poland. Land Use Policy, Elsevier, 30, pp. 791-799. https://doi.org/10.1016/j.landusepol.2012.06.003
10. Ostaev, G., Mukhina, I., Alexandrova, E., Belokurova, E., Titova, L. (2021). Development of a methodology for determining financial security of rural areas. Revista De La Universidad Del Zulia, 12 (32), pp. 70-86. https://doi.org/10.46925//rdluz.32.06
11. Svitin, V. (2019). Land administration. Vol. 1. Theoretical and methodological foundations [Upravleniye zemelnymi resursami. T. 1. Teoreticheskiye i metodologicheskiye osnovy]. Belorusskaya nauka, Minsk.
12. Wallace, J., Williamson, I. (2007). Building land markets. Land Use Policy, 23 (2), pp. 123-135. https://doi.org/10.1016/j.landusepol.2004.07.003

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ENVIRONMENTAL AWARENESS OF YOUNG CONSUMERS ON THE EXAMPLE OF STUDENTS OF THE UNIVERSITY OF RZESZÓW

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ABSTRACT

The justification for the selection of the topic and undertaking the research were information gaps in the field of the behaviour of young consumers in the area of activities related to the environment. The study used a deliberate selection of the sample due to the direction and year of education, as well as the stratified selection – the population structure and the divisions into layers according to specific characteristics were known. The technique of auditorium survey was used. The analysed students are characterised by a high level of environmental awareness and a sense of responsibility for them as informed and pragmatic consumers. They engage in pro-ecological behaviour and, as committed and ecological consumers, create the desired patterns of consumer behaviour. The analysed students have a sense of responsibility for the surrounding environment, and the belief in individual influence is reflected in pro-ecological behaviour.

Key words: ecological awareness, environmental protection, consumer behaviour
JEL code: D12

INTRODUCTION

The constantly deteriorating condition of the natural environment determines the search for more effective ways to care for the surrounding nature. This search focuses on activities in the field of technology (modern technologies that protect and restore the ecosystem balance) or socio-economic, political, and legal, taking the form of cooperation of social and economic organizations to develop both environmental protection mechanisms and their effective implementation. Nevertheless, the area of key importance in the area of education relating to social and individual awareness, where a change in attitude and sensitivity to environmental issues is necessary, expressed, inter alia, in changing the lifestyle, which will be changed in consumer behaviour.

THEORETICAL BACKGROUND

Defining the concept of environmental awareness is difficult because of the compilation of elements from both the social and natural sciences. It was requested to manage the awareness of the quality of social ele-

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ments whose social elements were introduced into the thinking and standards of people who became part of the awareness, quality, and quality awareness of society (Bieniasz-Marek, 2004; Papuziński, 2006). To define the state of ecological awareness, Burger introduced two conceptual categories: the pro-ecological attitude as clear and decisive advocacy of environmental protection and ecological indifference, which can take the form of favouring environmental protection but not demonstrating a pro-ecological attitude, a form of indifference and lack of interest in the issue, noticing the problem of protection but lack of activity in this area and a form of conscious opposition to environmental protection (Burger, 2005).

The level of awareness of Poles is constantly monitored. The most extensive research in this area was carried out by the Institute for Sustainable Development (InE), operating since 1990. Fragmentary design studies are also undertaken for selected areas and issues (Albińska, 1999/2000; Bayer Sp. z o.o, 2005; Bołtromiuk and Burger, 2010; Center for Ecological Education, 2010). It is also worth noting the review of research carried out in the years 2009–2015 on the awareness, attitudes, and behavior of Poles, extended to topics and problems for which there is a lack of reliable data (TNS Polska dla Ministerstwa Środowiska, 2015), specific – including teachers, children, and youth.

It is these groups that are extremely important from the perspective of spreading ecological knowledge and shaping ecological habits. It is important to strengthen the belief among children and adolescents that the fate of nature and responsibility for its condition does not only depend on the world of trade and politics but also (to the greatest extent) on individual individuals, being the sum of their small and larger decisions.

Environmental education of the society is the task of, among others for schools at all levels, but also universities. Sustainable development requires investments not only in modern and/or pro-ecological technologies and rational management of natural resources but above all high ecological awareness, which also means readiness to engage in solving problems related to the protection of the natural environment (Moryń-Kucharczyk, 2016).

MATERIAL AND METHODOLOGY OF RESEARCH

The rationale for the selection of the topic and undertaking the research was the research deficit and information gaps in the field of the behaviour of young consumers in the area of activities related to environmental protection. The research used the method of a diagnostic survey, the technique of an auditorium survey due to the high degree of sample control, and the same measurement conditions for all respondents. The survey questionnaire consisted of nine questions (closed disjunctive, semi-open conjunctive, and scaling questions) and metrics. The selection of the sample was purposeful due to the field of study (education programmes containing the content of environmental education) and the year of education (first; students of the University in Rzeszów) and the stratified structure – the population structure and division into layers according to specific characteristics (field of study: Finance and, Biology, Agriculture, Economics). The research sample consisted of $N = 143$ people, which constitutes 80% of the population.

The research aimed at obtaining answers to the following research problems:

1. What level of environmental awareness and the sense of responsibility for it characterize students as informed and pragmatic consumers.
2. Do students, as committed and ecological consumers, undertake pro-ecological consumer behaviour, creating the desired patterns of such behaviour?

RESEARCH RESULTS AND DISCUSSION

The social side of the person-opinion relationship. Good environmental condition first with the preliminary assurance that it was determined by 67% (in Poland) and 85% in the area, respectively. In this context, initiatives to explore what accounts for the main sources of information.

For 3/4 of the surveyed students, the main source of information about environmental protection was the Internet, and 68% indicated television. These media constitute an information reality for young consumers. It should be noted that the respondents then indicated their observations (31%) and the school/

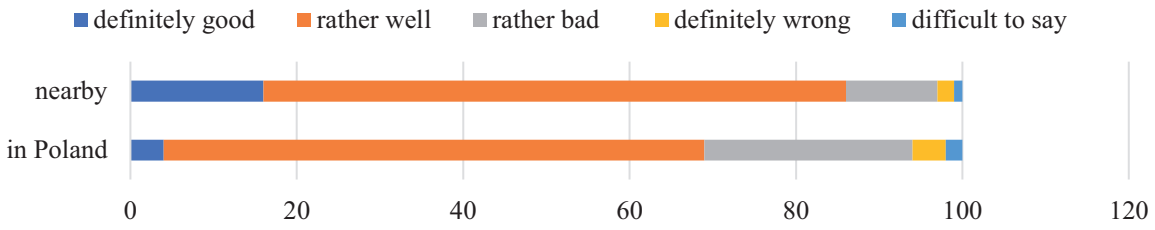

Figure 1. Assessment of the state of the natural environment

Source: own study.

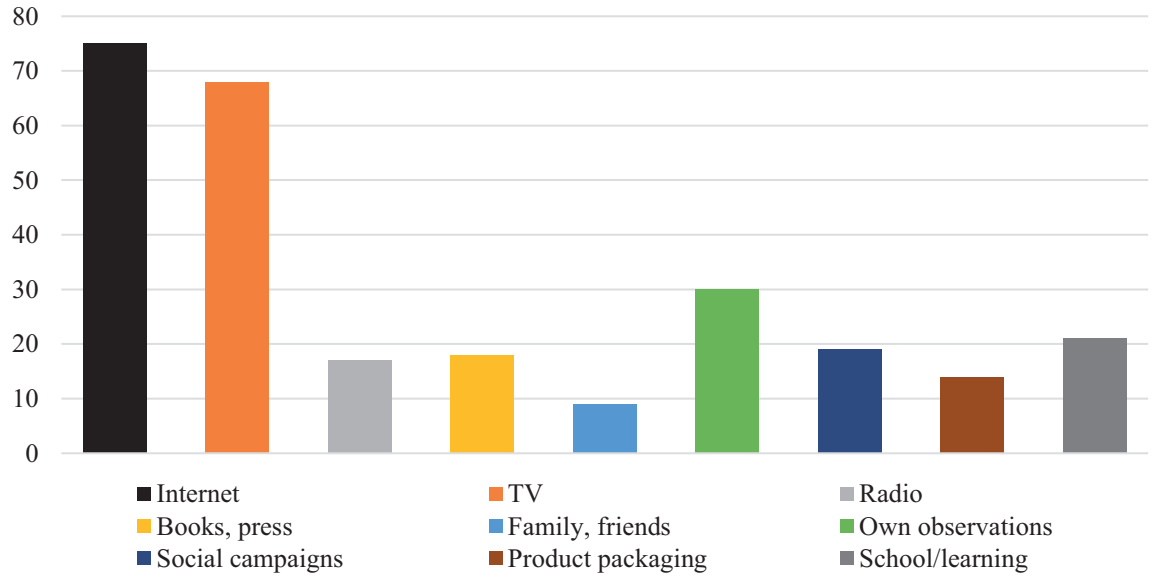

Figure 2. Sources of information on the state of the natural environment

Source: own study.

/university (22%) as a source of information about the natural environment. This confirms the need to continue environmental education, noting its important role in spreading knowledge, conducive to shaping correct attitudes. What is surprising, however, is the small number of indications for family and friends as a source of knowledge in the field studied (9%).

In terms of the functioning of the respondents as informed and pragmatic consumers, it is extremely important to indicate what / whom the state of the environment depends on. Has the increase in the level of ecological knowledge and sensitivity to the problems of the natural environment as a feature of young consumers (students) also shifted the burden of responsibility for the environment from state institutions to the local government, local communities, and, most importantly, individual level?

As they feel responsible for the surrounding environment (3/4 of the respondents believe that it depends on the activity of each of them), the conviction about the possibilities of individual impact on the environment should be reflected in pro-ecological behaviour also in the context of everyday life (shopping behaviour). In this context, it should be checked whether

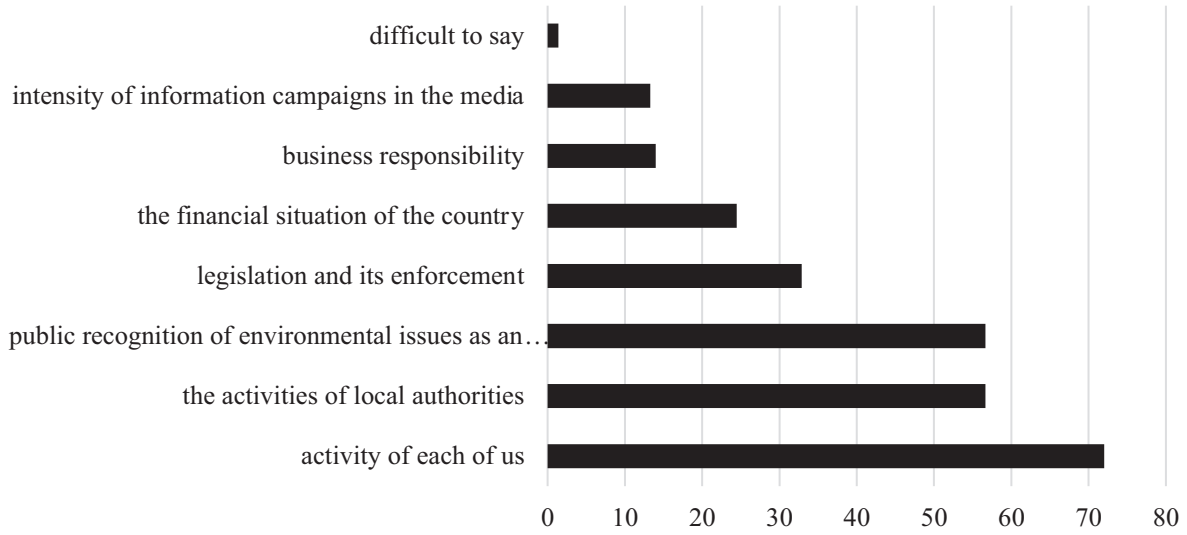

Figure 3. Responsibility for the condition of the natural environment

Source: own study.

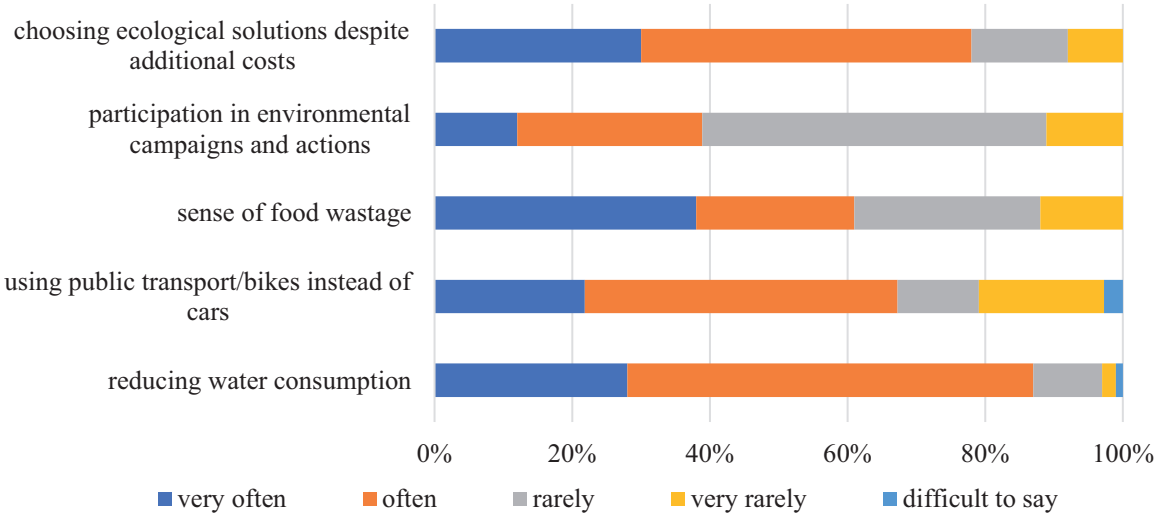

Figure 4. Declared pro-ecological consumer behaviour

Source: own study.

there is a discrepancy between the declared values and the actual actions. The value itself, the sparkle of values, is not a volume with their real value.

Most of the respondents declare the implementation of behaviours that can be treated as pro-ecological. More than 3/4 declare saving and rationalization of water consumption, while almost 3/4 replace the car with a more ecological bicycle or public transport. The young generation is by far the most active physically, hence the use of the bicycle as a means of transport that combines 'business with pleasure' is slowly becoming standard. It is quite

a common sight in urban reality, which also enters smaller towns. Young consumers also learn to take more rational actions in the purchase of fast-moving consumer goods (FMCG). Although changes in purchasing behaviour are influenced by the trends described above, their implementation takes time. The motive of pro-ecological behaviour may, however, raise doubts – is it a high level of ecological awareness or – more likely – economic reasons? This question is partially answered by the declaration of over half of the respondents – rarely and very rarely – choosing ecological solutions if they entail additional costs.

The deepening of the analysed thread is directly asked about the reasons why it is worth protecting

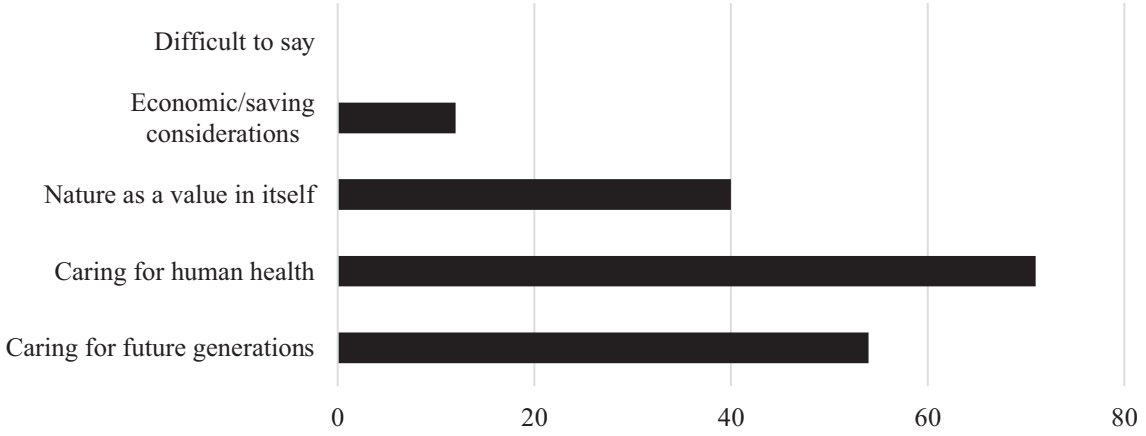

Figure 5. Reasons for the need to protect the natural environment.

Source: own study.

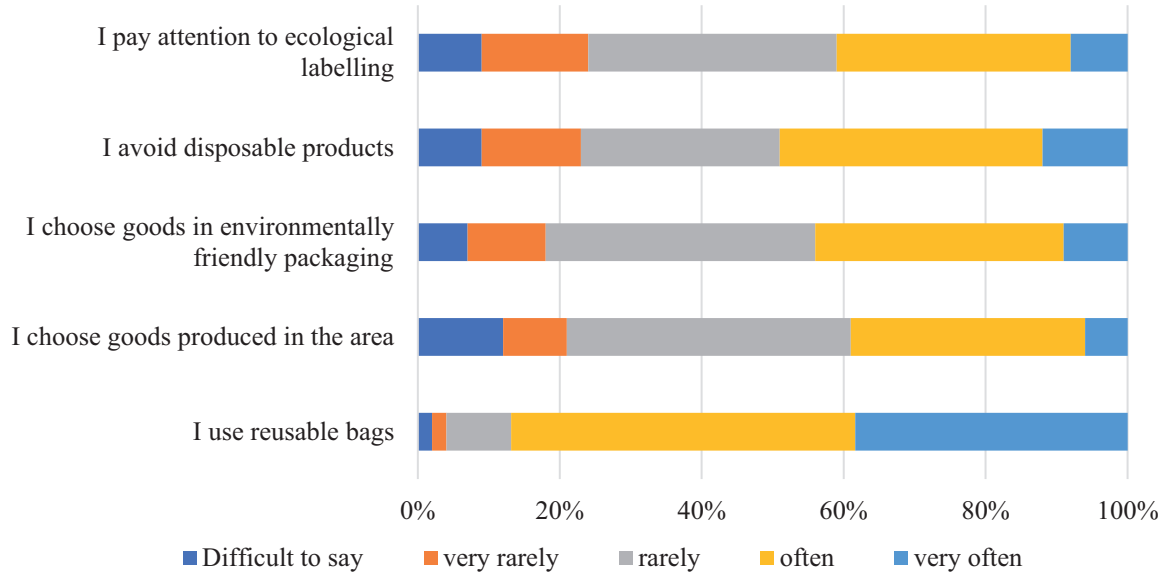

Figure 6. Implemented pro-ecological consumer behaviour of the respondents

Source: own study.

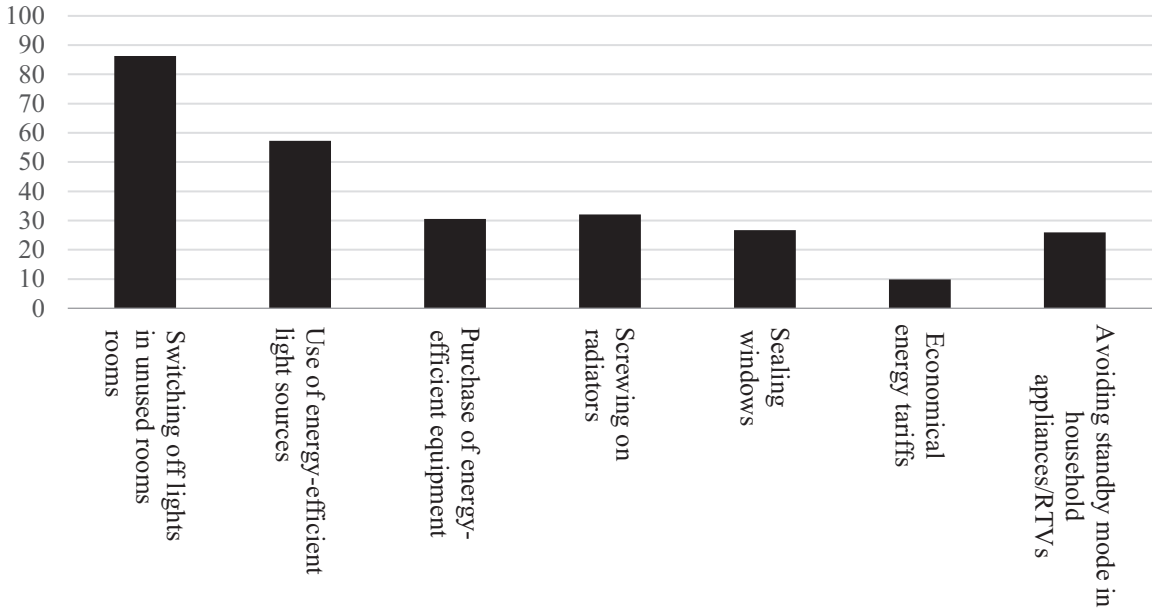

Figure 7. Realised energy saving methods

Source: own study.

the environment. Nearly 3/4 of the respondents indicate without hesitation that they care for human health, and more than half – that they care for future generations. The economic aspect was indicated as the least important reason.

How does the implementation of actual pro-ecological consumer behaviour look like against this background and does knowledge translate into practice? You can know hundreds of rules, but not apply them at all. Eighty five percent of respondents use reusable bags and nearly half (49%) avoid disposable/perishable products. Respondents also pay attention to labels related to ecology and the environment (49% in total). Unfortunately, environmentally friendly behaviours are often not implemented – seldom and very rarely (52% in total), goods in ecological packaging or produced in the vicinity of their residence are selected (51% in total).

A deepening of the analysed thread is the question of rationalization of consumption – the most identical to environmental protection – resource, i.e. energy. Among 131 respondents who save energy, it most often takes the form of turning off lights in unused rooms (86%) and using energy-saving light sources (57%). Behind such behaviour, however, is probably the pragmatism of users in the form of measurable financial benefits. This is also confirmed in consumer behaviour, where the priority of choice is often saving money, as is the case, for example, in the case of choosing energy-saving devices.

In terms of the consumer behaviour of engaged young consumers, the recognition of ecological product labels is an important factor in product selectivity – then how does this work in practice? Does the declaration go hand in hand with the recognition of pro-ecological labels? It turns out that of the ten most common markings, the most recognizable one is the one symbolizing that the product is recyclable. This is because its presence on the packaging is an effect of an obligation, and the commonness of its presence on everyday goods gives the average consumer a chance to come into contact with it many times. Half of the respondents also indicated the eco-label EKO and organic production (EU).

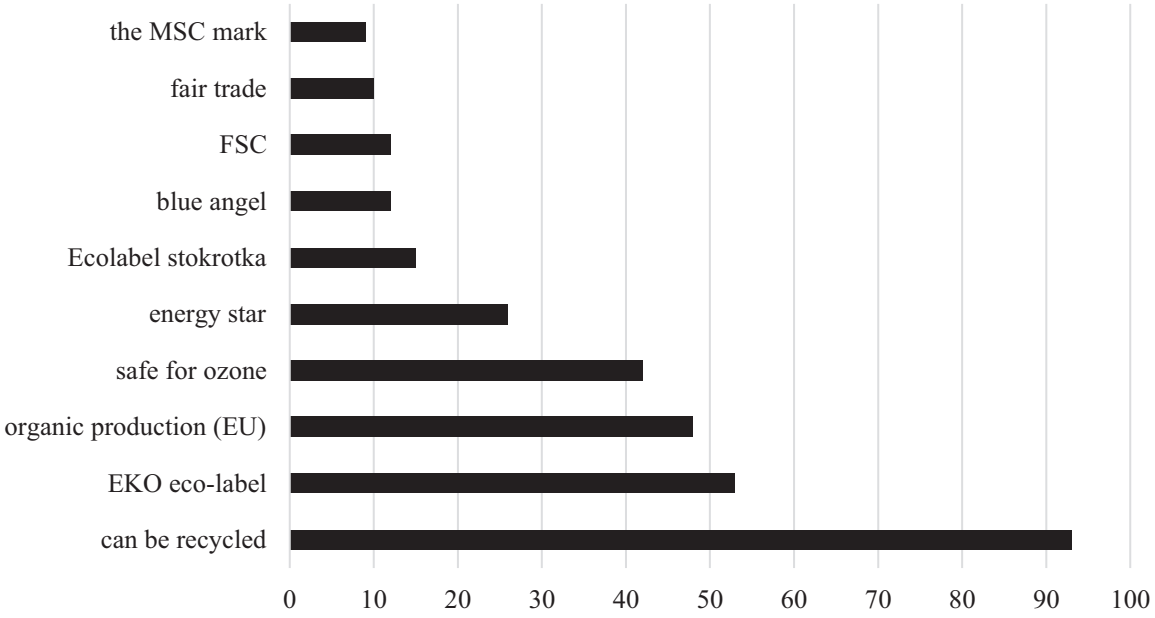

Figure 8. The degree of recognition of ecological product labels

Source: own study.

CONCLUSIONS

Ecological awareness is the cause and consequence of human concerns about the quality of life in a situation of constantly progressing degradation of the elements of the environment. Therefore, a change in attitude and sensitivity to environmental issues is necessary, expressed, inter alia, in a change in lifestyle, which will be illustrated by changes in consumer behaviour.

The presented research shows a fairly uniform picture of the environmental awareness of students as informed and pragmatic consumers. Their informational reality in the form of the Internet has been supplemented with an indication of the informative role of the school, which confirms the need for environmental education conducive to shaping correct attitudes.

Young consumers feel responsible for the environment around them. Their belief in the individual impact – as committed and ecological consumers – translates into pro-ecological behaviour, use reusable bags, avoid disposable/perishable products and reduce energy consumption. However, the concern for the environment verbalised and implemented by the respondents did not always go hand in hand with the actual pro-ecological behaviour, especially if it meant incurring additional costs. However, this does not change the fact that they contribute to reducing the consumption of environmental resources.

REFERENCES

1. Albińska, E. (1999/2000). Społeczne aspekty relacji człowiek-przyroda w ocenie młodzieży Lubelszczyzny. Człowiek i Przyroda, 11-12, pp. 73-92.
2. Baran, M., Kłos, M. (2014). Pokolenie Y – prawdy i mity w kontekście zarządzania pokoleniami. Marketing i Rynek, 5, pp. 923-928.
3. Bayer Sp. z o.o. (2005). Badania świadomości ekologicznej Polaków. Retrieved from: http://www.eduskrypt.pl/ebookswiadomosc_ekologiczna_polakow__wyniki_badan_przeprowadzonych_przez_gfk_polonia_we_wspolpracy_z_firma_bayer-487.html [accessed 03.2021].

4. Bieniasz-Marek, A. (2004). Świadomość ekologiczna – czym jest i jak się kształtuje. Środowisko i Rozwój, 10 (2), pp. 83-87.
5. Bołtromiuk, A. (Ed.), Burger, T. (2008). Polacy w zwierciadle ekologicznym. Raport z badań nad świadomością ekologiczną Polaków w 2008 r. Instytut na rzecz Ekorozwoju, Warszawa.
6. Burger, T. (2005). Świadomość ekologiczna społeczeństwa polskiego. Instytut Gospodarki i Przestrzeni Miejskiej, Warszawa.
7. Center for Ecological Education, 2010. Retrieved from: https://www.snf.org/en/newsroom/newsletter/newsletter-archive [accessed 03.2021].
8. Moryń-Kucharczyk, E. (2016). Edukacja i świadomość ekologiczna studentów uczelni technicznych. Edukacja – Technika – Informatyka, 2 (16), pp. 264-271. https://doi.org/10.15584/eti.2016.2.35
9. Papuziński, A. (2006). Świadomość ekologiczna w świetle teorii i praktyki (Zarys politologicznego modelu świadomości ekologicznej). Problemy Ekorozwoju, 1 (1), pp. 33-40.
10. Pierzchała, K., Pierzchała, K. (2021). Świadomość etyczna i ekologiczna młodych konsumentów marek modowych. Raport z badań 2020. Koło Naukowe Wielokierunkowej Indywidualnej Ścieżki Edukacyjnej, Uniwersytet Ekonomiczny w Krakowie, Kraków.
11. TNS Polska dla Ministerstwa Środowiska (2015). Raport z analizy badań świadomości, postaw i zachowań ekologicznych Polaków przeprowadzonych w Polce w latach 2009-2015. Retrieved from: https://www.gov.pl/web/nfosigw/raport-z-analizy-badan-swiadomosci-postaw-i-zachowan-ekologicznych-polakow-przeprowadzonych-w-polsce-w-latach-2009-2015 [accessed 03.2021].

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COMPARISON OF COMPETITIVENESS BETWEEN BULGARIA, EU, USA, AND NEW ZEALAND DAIRY SECTORS

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ABSTRACT

Defining the state of competitiveness for a particular agricultural sector is of great importance. By retaining a competitive market position sustainable economic development of the specific agricultural production is supported. Continuation of its multiple economic functions like providing raw materials for the processing industry, securing rural employment, and utilization of scarce agricultural resources is the focus of competitiveness goals. In the economic theory, there is no unified definition for competitiveness, while there are a variety of approaches to measure it, which is reflected in different applied theoretical frameworks. The research aims to compare the competitiveness of the Bulgarian dairy sector versus the EU, the USA, and New Zealand dairy sectors on the world market for the period after the accession of Bulgaria in the EU. Therefore, a conceptual framework has been chosen developed by Canada's Task Force for Competitiveness. The framework is based on the ability to gain and sustainably maintain market share. For the chosen period the results show a trend of decline in the competitiveness of the Bulgarian dairy sector and improvement in the competitiveness of the EU dairy sector. For the EU comparison, indexes of competitiveness have been calculated for the USA and New Zealand. The USA's index slightly decreased at the end of the explored period reflecting the increased competition on the world markets while New Zealand's high index values reveal its position as a leading dairy products exporter.

Key words: dairy, index of competitiveness
JEL codes: F19, Q17

INTRODUCTION

Retaining a competitive market position supports the sustainable economic development of the specific agricultural production and continuation of multiple economic functions like providing raw materials for the processing industry, securing rural employment, and utilization of scarce agricultural resources. Because of this, defining the state of competitiveness for a particular agricultural sector is of great importance.

From that perspective, exploring the competitive performance of the Bulgarian dairy sector aims to show how the state of competitiveness has been affected by changes in economic conditions after the country accedes to the EU in 2007. Up to 2018 there was a decline in milk production (–21.7%) and the number of specialised farms decreased significantly

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(–84%), but the average number of dairy cows per specialised farm increased to 12 due to the concentration of production in a smaller number of farms. Demand for cheaper raw materials from the processing industry led to an increase in imports of milk powders and condensates from the EU.

It is important to explore the trends of competitive performance of the European dairy sector on the international market. After the abolition of milk quotas in 2015, there is increased price volatility in the EU caused by milk overproduction and price fluctuations transferred from external markets by pressure on export prices from the competition.

The USA and New Zealand are substantial producers and although the natural conditions and size of farms are different, it is important to apply the chosen framework to have a common base for comparison with the EU and Bulgaria.

MATERIALS AND METHODS

Synopsis studies on approaches measuring international competitiveness by Hatzichronoglu (1996) and competitiveness in agriculture by Frohberg and Hartmann (1997), and Latruffe (2010), represent a fragmented theoretical field regarding applicable methods. Frohberg and Hartmann separate approaches into two categories – measuring competitiveness potential and ex-post competitive performance. Latruffe divides them into three groups: trade measures, strategic management measures, and determinants of competitiveness. The incoherence in theory reveals itself in a variety of competitiveness concepts and as many incompatible definitions. Bris and Caballero (2015) list 13 published competitiveness definitions and add their own. The divergence, in theory, is to some extent due to the economic level of the research that is carried out, whether it is for a particular product, for sets of business units, or on the national economy level. Established theoretical frameworks like Michael Porter's National 'diamond' framework focusing on the performance of companies and Heckscher-Olin's model evaluating abundance and cost of national factors of production may be associated with competitiveness revealed on different levels. From the review, a conclusion can be made – some concepts and frameworks are more suitable than others for the evaluation of agricultural competitiveness according to specific research purposes. According to Ivanov and Stoychev (2017), which followed the evaluation algorithm proposed by Ivanov (2016), that the competitiveness is a stationary state connected to the capability of a dairy livestock in Bulgaria to uphold and expand its market share, to maintain and enhance the added value in national and international stage.

Generally, speaking on the competitiveness, it is viewed from the one hand as a market performance of the industry or the sector, which is a narrow understanding of the concept whereas on the other hand as factors or prepositions standing behind that performance. The state of competitiveness for Bulgarian dairy products has been explored by Slavova et al. (2006). The Bulgarian net foreign trade balance for dairy products is accepted as an indicator for relative product competitiveness. Due to its positive values for the four years after 2000, a conclusion is drawn that production and trade with dairy products on international markets are highly competitive. In a comparative study of dairy chain competitiveness in new member states and candidate countries, van Berkum (2009) emphasizes the significant number of small farms which are not competitive on local markets and have problems with the quality of milk. The exit of these farmers from the sector is just a matter of time and opportunities. Such a development indeed happened, triggered by the implementation of the EU regulation for the quality of raw milk[1].

Our approach for measuring competitiveness is different because it combines and quantifies the dairy sector's performance on national and international markets at the same time. We have chosen a theoretical framework developed by Canada's Task Force for Competitiveness in Agri-Food Sector: 'The sustained ability to profitably gain and maintain market share' (Martin, Westgren and van Duren, 1991). It was developed for the evaluation of a bilateral trade agreement between the USA and Canada. The definition

[1] After Bulgaria accession to the EU for eight years there were a derogation for implementation of milk quality regulations.

carries in itself two components that can be used to measure and monitor competitiveness on agricultural product markets: expressed by sustainable creation of value and change in market share.

The study is made on the macroeconomic level. We believe the applicable level of abstraction is admissible given our goal to depict competitiveness at the sectoral level and to quantify its performance. The approach also presents an opportunity to compare economies different in size. Modelling competitive performance is a process of simplification helping to better delineate trends over time, but also to omit determinants influencing production at a lower level, specific for each country, like natural and climatic conditions, the average scale of production, dominant dairy cattle breeds, integration of dairy chain, etc.

To attain uniformity of data, all dairy products are presented in protein equivalent[2]. Production and consumption are weighted by several country populations allowing results to be comparable. It is very difficult to determine the size of world stocks of dairy products and the assumption is made that they tend to zero and therefore world production of dairy products is identical to human consumption.

Following this framework, the index of competitiveness is composed of two components – market performance component and value component. We assume they are equally important; therefore, they can be expressed as:

$$index\ of\ competitiveness = \frac{(PICmpc + PICvc)}{2}. \quad (1)$$

The index takes values between 0 and 1. The value becomes zero when there is no local production. A value of 1 can be reached when national production is solely the world. When the local and world production equalizes, the index takes the value of 0.5.

The market performance component (*PICmpc*) is expressed as follows:

$$PICmpc = \frac{MPctr}{MCctr + MCwd + (MEnctr)}, \quad (2)$$

where:
MPctr – country milk production per capita,
MCctr – country milk consumption per capita,
MCwd – world milk consumption per capita,
MEnctr – net export of milk products per capita.

In the denominator of expression (2) double counting is avoided through exclusion of local consumption per capita out of world consumption per capita (*MCwd*). The net export of dairy products (*MEnctr*) from the country is calculated lessening the total country export of dairy products minus import. It is applicable only if the country is a net exporter of dairy products in order to keep the country milk production indicator (*MPctr*) at least equal to the sum of domestic milk consumption (*MCctr*) and the country export of milk equivalent:

$$MEnctr = MEctr - MIctr, \quad (3)$$

where:
MEctr – country dairy export per capita,
Mlctr – country dairy imports per capita.

The value component (*PICvc*) presents the change in the value of dairy products and is expressed by the following equation:

$$PICvc = \frac{MVctr}{MVctr + MVwd}, \quad (4)$$

where:
MVctr – share of the gross value of local dairy production per capita,
MVwd – share of the gross value of world dairy production per capita.

While the value *MVwd* is calculated, the value of local dairy *MVctr* production is excluded. The greater the difference between the gross value of domestic

[2] The amount of protein and fats in a tonne of milk are almost the same. It is enough to work with one of these components for calculations.

production and the world value of the cow's milk produced, the greater the significance of *PICvc*. The calculation is made based on export prices of dairy products from the country and the world, which reflects the added value along the value chain.

RESEARCH RESULTS AND DISCUSSION

On Figure 1 are presented developments of the *PICmpc* in dynamics. For Bulgaria is observed sustainable decline (–25%) for the period examined due to a decline in the volume of milk production. The EU28 position is stable and does not change over time. The USA's development is positive, resulting in a constant increase in market performance surpassing the EU index level in 2008. New Zealand has the highest values for market performance because of the highest share of export from local milk production. It has little improvement over the period.

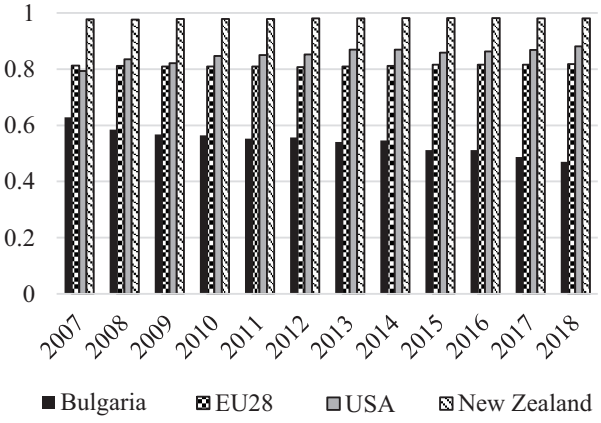

Figure 1. Production component dynamics

Source: United Nations (2018), International Trade Centre (2019), Eurostat (2021), own calculation.

Development of *PICvc* for different countries are is presented in Figure 2. There is a decline in component value for Bulgaria after the Global financial crisis in 2009. In the next years a recovery begins until 2016 and after that again starts to decrease in value. The EU development decreases until 2012 but it recovers and at the end of the period it has a higher value than in the beginning. For the USA the value component varies, reaching a peak in 2015 and minimum in 2018, below the 2007 level. The New Zealand performance shows some volatility up to 2011 and after that, it is moving around 0.975.

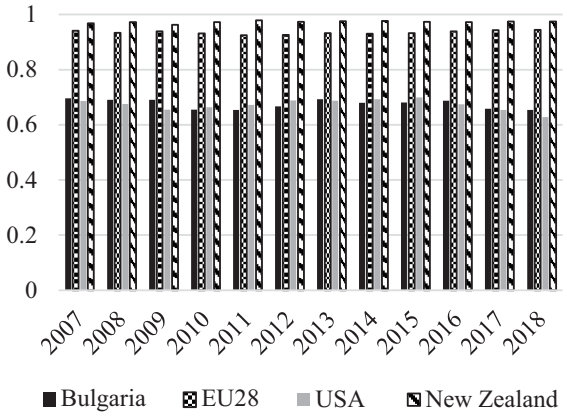

Figure 2. Value component dynamics

Source: United Nations (2018), International Trade Centre (2019), Eurostat (2021), own calculations.

Composite indexes of competitiveness are presented in Figure 3. The Bulgarian index is the only one steadily declining. The performance of the index for the EU decreased slightly until 2012, has a positive trend after that, and at the end of the period shows improvement in competitiveness. The main reason for that development is variation in the value component. For the USA the index shows significant

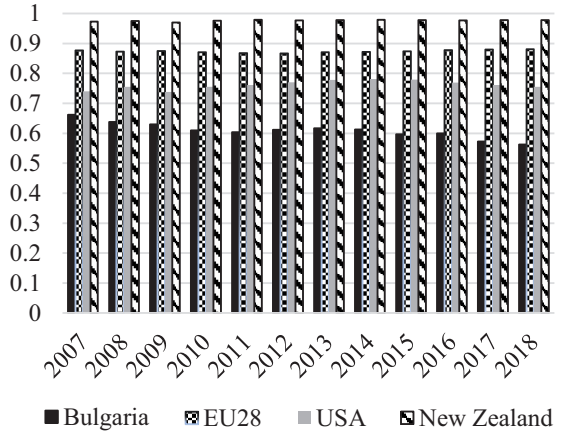

Figure 3. Index of competitiveness dynamics

Source: United Nations (2018), International Trade Centre (2019), Eurostat (2021), own calculations.

improvement but it decreases for the last three years due to a decrease in value component. For New Zealand, the index takes a minimum in 2009 and steadily increased up to 2014 and flattened after that.

CONCLUSIONS

Competitiveness is a widespread research topic in agricultural economic studies and it is commonly viewed through the prism of performance or as factors driving this accomplishment. The analysis tries to reveal the comparative dairy industry performance of Bulgaria, the EU, the USA, and New Zealand over 10 years. Adopting a methodology for estimating the index of competitiveness is envisaged to trace up the differences and evolution in terms of production and value forming of dairy industries in selected countries and to review the feasibility of the estimation method.

The competitive performance of the EU decreases up to 2012 with a positive trend at the end of the period. Dairy products with higher margins as cheeses, infant formula, and others, help to maintain the EU's competitive performance. The positive development of the USA index of competitiveness shows the growth of dairy products export is increasing steadily resulting in constant improvement in market performance. A decrease in the value of the index of competitiveness after 2015 is due to a decrease in the value of export, reflecting the increased competition in the world markets.

New Zealand has the highest competitiveness index due to the huge production of milk and dairy products for export compared to local consumption and therefore takes the leading position as a dairy exporter. Its production per capita significantly surpasses the EU and the US production, but the index of competitiveness shows retention of the level achieved after 2014.

The Bulgarian index of competitiveness steadily decreases over the period after accession to the EU. That result reflects the decrease in milk production due to the diminishing number of dairy cows, farms' adaptation to common market conditions, and increased competition from imported raw materials for processing. Another reason is Bulgarian dairy products export specificity, targeted at niche markets, therefore they are not able to take advantage of world dairy markets growth. As a result of our analysis, Bulgarian authorities have to support investments in dairy farms, targeting an increase in milk production, to improve the competitiveness of the dairy sector.

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REFERENCES

1. Berkum, S. van (2009). Dairy chain competitiveness in EU's new member states, candidate and potential candidate countries. Agrarwirtschaft, 58 (7). Retrieved from: https://research.wur.nl/en/publications/dairy-chain-competitiveness-in-eus-new-member-states-candidate-an [accessed 05.2021].
2. Bris, A., Caballero, J. (2015). Revisiting the Fundamentals of Competitiveness: A Proposal. IMD World Competitiveness Yearbook, pp. 492-503.
3. Eurostat (2021). Population on 1 January by age and sex [demo_pjan]. Retrieved from: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_pjan&lang=en [accessed 05.2021].
4. Frohberg, K., Hartmann, M. (1997). Comparing measures of competitiveness. Discussion Paper, 2. Institute of Agricultural Development in Central and Eastern Europe, Halle. Retrieved from: http://nbn-resolving.de/urn:nbn:de:gbv:3:2-22616 [accessed 05.2021].
5. Hatzichronoglu, T. (1996). Globalization and Competitiveness: Relevant Indicators. OECD, STI Working Paper, 1996/05, Paris, pp. 19-23.
6. International Trade Centre (2019). ITC Trade Map. Retrieved from: https://www.trademap.org/Index.aspx [accessed 05.2021].
7. Ivanov, B. (2016). Dairy model and projections. Centre for Agri-policy Analysis – CAPA, Institute of Agricultural Economics, Sofia.
8. Ivanov, B., Stoychev, V. (2017). Index of competitiveness in dairy cattle sector. In: Proceedings of conference: Agricultural development and commodity market projections. Agricultural Academy. Avangard Prima, Sofia, pp. 151-161.

9. Latruffe, L. (2010). Competitiveness, Productivity and Efficiency in the Agricultural and Agri-food Sectors. OECD Food, Agriculture and Fisheries Papers, 30. OECD Publishing, Paris.
10. Martin, L., Westgren, R., Duren, E. van (1991). Agribusiness Competitiveness across National Boundaries. American Journal of Agricultural Economics, 73 (5), pp. 1456-1646.
11. Slavova, Y., Kovacheva, Tz., Ivanova, N., Atanasova, M., Draganov, M., Terzijska, K. (2006). Competitiveness of agricultural products on the domestic and international market. Avangard Prima, Sofia.
12. United Nations (2018). Population Division. World Urbanization Prospects 2018. Data Query. Retrieved from: https://population.un.org/wup/DataQuery [accessed 05.2021].

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THE CONTRIBUTION OF BREWERIES TO THE V4 ECONOMY

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ABSTRACT

The consumption of beer can be considered a cultural element of many European countries. Therefore, it represents a great contribution to Central European economies mainly in terms of employment, value-added or taxes and duties. Since beer has a plentiful history and permanent popularity, the most powerful global multinationals gradually took over the global market over the last few decades. Therefore, globalization highly affected the structure of the brewing industry that caused the homogenization of products. The aforementioned and also other factors have led to the increase in the establishment of local craft breweries which produce the beloved beverage characterised by traditional recipe and uniqueness. Hence, in this article, we are focusing on the selected macroeconomic indicators like employment or excise duties generated by breweries in Poland, Slovakia, Hungary, and the Czech Republic. Since there is no separate economic data available on industrial and craft beer yet, we focused on the economic impacts of the brewing industry in general, during the period 2010–2019. In the first part of the results, we provide the rate of excise duty on beer as opposed to other alcoholic beverages and in the second part, we focus on direct employment in the industry. The last part focuses on the relation between these two variables by using regression analysis.

Key words*:* excise duties, direct employment, V4, the brewing industry

JEL codes: E24, F60, L66

INTRODUCTION

Beer is one of the most popular alcoholic beverages in the V4 countries which have a rich history of brewing behind them. When it comes to the global economic impact of this industry, the beer industry reports about 294.5 billion USD annual revenues globally (Feng, 2017). Among other countries, the Czech Republic and Poland reached the highest per capita beer consumption rate globally in 2018 (Kirin Holdings Company Limited, 2019). Therefore, the brewing industry has a great impact on the economies of Central European countries, for example in terms of the labour force and government revenues. During the last few decades, two main trends were formed that are still present on the market, one is the acquisition of various breweries and the expansion of craft breweries (Pokrivčák et al., 2018). In 2019, the most powerful multinational was AB InBev with 29.3% of the global market share, which was followed by Heineken with 12.6%, China Resources Snow Breweries with 6%, Carlsberg with 5.9%, Asahi with 3%, and with other giants. Consequently, 71.6% of the global market share was owned by the leading global breweries (Statista, 2021). On the other hand, many new craft breweries were established recently in

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Central European countries. Between 2010 and 2019, there were more than 350 new craft breweries set up in the Czech Republic and 79 in Slovakia (Wojtyra et al., 2020). Therefore, besides the dominant industrial breweries, also craft breweries have a significant impact on the food and beverage market and the economies.

THEORETICAL BACKGROUND

The structure of the brewing industry has been significantly impacted by globalization, which caused many acquisitions in the sector globally. Since consumers in Poland, Hungary, Slovakia, and the Czech Republic affect relatively high demand for various beer products, the structure of the brewing industry has changed, as well. In Hungary, three main companies control the majority of the domestic market, Heineken Group, Asahi Group, and Molson Coors (Jantyik, Balogh and Török, 2021). After becoming independent, Slovakia and the Czech Republic experienced the privatization of breweries which were later taken over by multinationals such as Heineken and SABMiller (later assets were sold to the Japanese Asahi Group) (Kandráčová and Kulla, 2012). In the case of the Polish beer market, the same multinational companies are dominating the market (Wojtyra, Grudzień and Lichota, 2020).

During the last few decades, a new trend is present on the market of beer products that was caused by globalization and further homogenization of beer products (Howard, 2014). Traditional craft breweries started to gradually appear on the market in several countries. The characteristic of craft breweries is very specific since they use traditional recipes and production methods, high-quality ingredients and they produce smaller volumes of beer, which is differently set for every country (Carroll and Swaminathan, 2000). Based on research conducted in Hungary, microbreweries are often short-lived but there is a potential for the creation of a new market segment that is generated by younger generations who demand more expensive craft beers and are concentrated mainly in big university cities or the capital (Fertő et al., 2018). The production of beer has a significant impact on the Slovak economy, as in 2015 the total consumption of beer reached 372 million l, which means 73 l of beer per one citizen. Based on another article, in the case of 1 500 employees in this industry, each of them creates another 12 job positions in other industries, such as hospitality, trade, and supply chain (Dudić et al., 2018).

When it comes to taxation, the tax rate on beer is decided per hectolitre and per percentage volume of the actual content of alcohol, which means that the basic tax rate is set at 3.587 EUR and the reduced tax rate, which is applied for small breweries is 2.652 EUR in Slovakia (Financial Administration of the Slovak Republic, 2021). As the Czech Republic has a strong history of brewing, it has experienced an interesting development of this industry between 2000 and 2010. During this period, there was a rise in the number of existing breweries from 54 to 151, which was caused mainly by microbreweries, and from 2010 to 2019 there were more than 350 new enterprises set up (Březinová, Havelka and Bartoš, 2019). In Poland, beer is the second very-highly globalised industry sector besides other industry sectors, like tobacco, alcohol, confectionery, oil, and sugar (Chechelski, 2017). As opposed to spirits, fuel, and tobacco revenues, the budgetary revenues almost doubled for the last decade (Gołaś and Ścibek, 2010).

When it comes to the structure, the most interesting changes happened in the 1990s and 2000s, when foreign giants started the privatization and therefore various small-size breweries were liquidated. On the other hand, between 2010 and 2018 the number of new breweries rise from 70 to 372 (Wojtyra et al., 2020). In 2017, the beer production exceeded 30 million hectolitres in Poland, as Polish consumers are positioned among the top European consumers of beer in terms of the average consumption (Perkowska, Gromada and Golonko, 2019). According to Smoluk-Sikorska and Kalinowski (2011), there was a 0.99% share of production and sale of beer in total value added generated in the Polish economy in 2009.

MATERIALS AND METHODS

The main aim of this research paper is to analyse the impact of the brewing industry in terms of excise duty and direct employment in Poland, Hungary,

Slovakia, and the Czech Republic. Therefore, its purpose is to emphasize the importance of industrial and craft beer producers on the beverage market. Our results include both industrial and craft beer producers. However, we believe that industrial breweries have a remarkably higher impact on the economies as opposed to craft breweries. The macroeconomic data was obtained from the dataset of the EC. To obtain relevant data, we analysed the data from the EC and also from the last reports of Brewers of Europe, which besides the data collection connects national brewers' associations from 29 European countries (Brewers of Europe, 2021). In the case of Hungary, we added data from the Brewers of Europe dataset, and we used the yearly average exchange rates for Hungary based on the Euro foreign exchange reference rates by the ECB. For the second part of our research, we obtained data about the total labour force in the selected countries from The World Bank's online database and data about direct employment by breweries from the statistics of Brewers of Europe (World Bank, 2020; Brewers of Europe, 2021). In the last part of our research, we quantified the relationship between excise duty rate on beer and direct employment share by using the method of regression analysis (Directorate-General for Taxation and Customs Union, 2021). Therefore, this method analyses the interrelation between the obtained set of data (Chatterjee and Hadi, 2006).

RESEARCH RESULTS AND DISCUSSION

The results of our research paper provide a brief overview of the economic impacts of the brewing industry and the importance of the need to empower the sector of industrial beer production and especially craft beer production that maintains a great potential to grow and to support the production of local products in the food and beverage sector in the V4 countries. As was already mentioned, our paper consists of three main parts: (i) the rate of excise duty on beer in the V4 countries, (ii) the rate of direct employment by breweries in the V4 countries, and (iii) the relationship between excise duty rate on beer and direct employment share.

The rate of excise duty on beer in the V4 countries. In the first part of our analysis, we focused on the economic impacts of breweries from V4 countries in terms of excise duty.

Based on Figure 1, it is clear that there were no significant fluctuations in the share of beer as opposed to other alcohol products in the observed countries between the selected period. In the case of the Czech Republic, the percentages were moving between 32.81% (2019) and 42.12% (2012). The most noticeable increase in the percentage share of beer in excise duty happened between 2011 and 2012 by 3.36%. In Hungary, the percentage share was slightly fluctuating. Therefore, the biggest increase happened

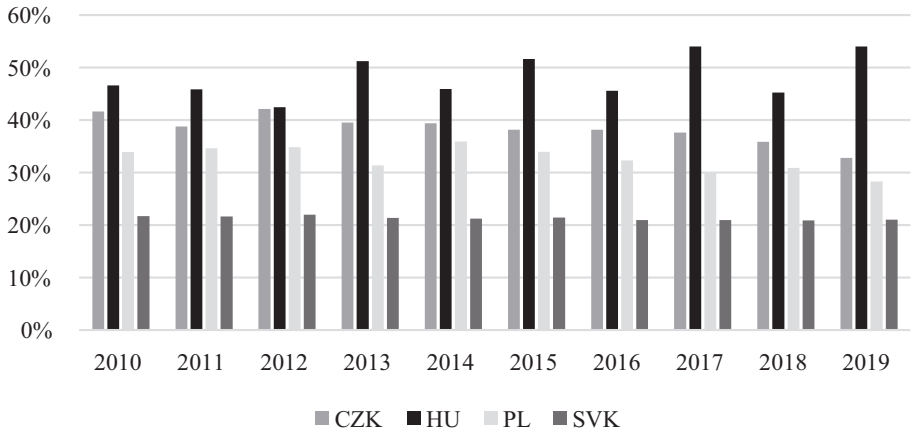

Figure 1. The share of beer on excise duty on alcohol products

Source: own study.

between 2018 and 2019 (45.24% to 54.01%) and the most visible decrease between 2017 and 2018 (53.99% to 45.24%). A similar trend could be observed in Poland, where the share of excise duty and consumption tax generated by beer was moved between 28.33% and 35.92% during the observed period. The highest value was reached in 2014 and the lowest in 2019. Similarly, to the Czech Republic, Slovakia reached the highest value, 21.97%, in 2012. Furthermore, the lowest percentage share was 20.89% in 2018.

The rate of direct employment by breweries in the V4 countries. In the second part of our research, we were analysing the impact of breweries on the labour force of the V4 countries between the years 2010–2019.

As it can be seen in Table 1, employment by the sector of breweries has a very slight influence on employment in the V4 countries. This result could be explicated in several discussions since the percentage values from Table 1 represent only the share of breweries in the labour force in the production sector. The beer itself generates many jobs in other sectors, such as hospitality, retail, supply, and others. Unfortunately, the collection of such complex data is very difficult because of many reasons. On the other hand, our results that are provided in Table 1 demonstrate that the rates of direct employment are not fluctuating, so this industry has retained its strong position on the market of V4 for the last decade. Based on our research the rate of direct employment by breweries changes between 0.10% and 0.13% in the Czech Republic, 0.04% and 0.05% in Hungary, 0.05% and 0.09% in Poland and 0.05% and 0.07% in Slovakia. However, the indexes that represent the percentual change between 2010 and 2019 resulted in a decrease for all observed countries.

The relationship between excise duty rate on beer and direct employment share. In the last part of our analysis, we quantified the relationship between the excise duty rate on beer and direct employment share in the V4 countries during the selected period.

- H0: There is no dependence between the excise duty rate and direct employment share.

Table 1. The rate of direct employment by breweries to the total value of labour force in the V4 countries

×	×	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2010–2019
CZ	LF	5 241	5 233	5 269	5 323	5 324	5 337	5 388	5 419	5 452	5 441	–
	DE	7	6.8	7	5.8	5.9	6.1	5.8	5.6	5.6	5.6	–
	%	0.13	0.13	0.13	0.11	0.11	0.11	0.11	0.10	0.10	0.10	–22.94
HU	LF	4 299	4 316	4 369	4 403	4 527	4 617	4 685	4 714	4 732	4 750	–
	DE	2	1.7	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.9	–
	%	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	–15.60
PL	LF	18 036	18 103	18 227	18 269	18 388	18 315	18 378	18 444	18 390	18 318	–
	DE	15	–	16	16	16	10	10	9.3	9.5	9.5	–
	%	0.08	–	0.09	0.09	0.09	0.05	0.05	0.05	0.05	0.05	–37.64
SVK	LF	2 683	2 686	2 710	2 718	2 724	2 739	2 763	2 762	2 754	2 749	–
	DE	1.8	1.7	1.6	1.6	1.5	1.5	1.4	1.5	1.5	1.52	–
	%	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.06	–17.14

Source: own study.

Table 2. Regression analysis

×	CZ	HU	PL	SVK
Multiple R	0.68	0.17	0.00	0.92
R^2	0.46	0.03	0.00	0.85
p	0.02	0.61	0.99	0.00

Source: own study.

– H1: There is a dependence between the excise duty rate and direct employment share.

Based on the regression analysis (Table 2) for the Czech Republic and Slovakia we reject H0 and accept H1, while in the case of Hungary and Poland we accept H0 and reject H1.

CONCLUSIONS

We would like to emphasize the importance of the brewing industry since it contributes to the V4 economies in many ways, and they include a promising potential to invite foreign direct investments and also support the production of traditional local beer products, at the same time. In our article, we pointed out two economic indicators, excise duty, and labour force. The percentage share of beer on excise duty and consumption taxes on alcohol products was moving between 20% and 55% from 2010 to 2019 in the V4 countries. These results prove the importance of the presence of this industry in the Central European market. Therefore, it has a significant part in job creation that does not have an impact only on direct employment but also on employment in general, since it also influences other sectors, like hospitality, supply, retail, or others. Consequently, the rate of direct employment by breweries to the total value of labour force in the V4 countries was moving between 0.04 and 0.13% during the selected period. To support the growth of this industry, it should be essential for the government to provide financial support to the local microbreweries. They represent local enterprises with a focus on beverage production that can have many positive impacts on the economies of the V4. Besides job creation and strengthening of local production, this segment has far greater potential and impact on the economies. This proves that further government support is needed in the sector of local small breweries since it could be an effective way to support agrotourism and rural development in all the observed countries. In addition, the support of the sector of craft breweries could increase the level of employment in rural areas, which is currently considered a significant problem in Slovakia. The issue of the brewing industry, in terms of economy and consumption, is much broader than indicated in this paper, which provides us the possibility to propose further research in subsequent articles. Therefore, we remain positive about the development of the brewing industry, especially of craft breweries, and continue with further research of the impacts and promising opportunities of this industry.

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REFERENCES

1. Brewers of Europe (2021). Key facts and figures. Retrieved from: https://brewersofeurope.org/site/media-centre/key-facts-figures.php [accessed 20.04.2021].
2. Brezinová, M., Havelka, Z., Bartoš, P. (2019). Marketing communication in the beer industry in the Czech Republic concerning minibreweries. Krasny promise, 65, pp. 6-12.
3. Carroll, G.R., Swaminathan, A. (2000). Why the micro-brewery movement? Organizational dynamics of resource partitioning in the U.S. brewing industry. American Journal of Sociology, 106, pp. 715-762. https://doi.org/10.1086/318962
4. Chatterjee, S., Hadi, A.S. (2006). Regression analysis by example (Vol. 607). John Wiley & Sons, Hoboken, NJ.
5. Chechelski, P. (2017). Changes in the food industry in Poland under the impact of transnational corporations in the 21st century. Problems of Agricultural Economics, 353 (4), pp. 50-71. https://doi.org/10.30858/zer/84951
6. Directorate-General for Taxation and Customs Union (2021). Data on Taxation. Taxation and Customs Union – European Commission. Retrieved from: https://ec.europa.eu/taxation_customs/business/economic-analysis-taxation/data-taxation_en [accessed 20.04.2021].
7. Dudić, B., Dudić, Z., Smoleň, J., Mrkvová, K., Mirković, V. (2018). Beer and beer industry in Slovakia. Ekonomika poljoprivrede – Economics of Agriculture, 65 (1), pp. 349-354.
8. Feng, J. (2017). All About The Beer Industry. WorldAtlas. Retrieved from: https://www.worldatlas.com/articles/all-about-thebeer-industry.html [accessed 20.04.2021].

9. Fertő, I., Fogarasi, J., Major, A., Podruzsik, S. (2018). The Emergence and Survival of Microbreweries in Hungary. In: C. Garavaglia, J. Swinnen (Eds) Economic Perspectives on Craft Beer. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-58235-1_8
10. Financial Administration of the Slovak Republic (2021). Excise duties. Retrieved from: https://www.financnasprava.sk/en/individuals/taxes-individuals/excise-duties#TaxBasesAlcoholicBeverages [accessed 20.04.2021].
11. Gołaś, Z., Ścibek, M. (2010). Analiza tendencji zmian na polskim rynku piwa. Journal of Agribusiness and Rural Development, 15 (1), pp. 67-80.
12. Howard, P.H. (2014). Too big to ale? Globalization and consolidation in the beer industry. In: M. Patterson, N. Hoalst-Pullen (Eds) The Geography of Beer. Springer, Dordrecht, pp. 155-165.
13. Jantyik, L., Balogh, J.M., Török, Á. (2021). What Are the Reasons Behind the Economic Performance of the Hungarian Beer Industry? The Case of the Hungarian Microbreweries. Sustainability, 13 (5), 2829. https://doi.org/10.3390/su13052829
14. Kandráčová, V., Kulla, M. (2012). Brewing in Slovakia. In: Geography and geoinformatics: a challenge for practice and education: 19th International Conference: proceedings. Masarykova univerzita, Brno, pp. 278-286.
15. Kirin Holdings Company Limited (2019). Global Beer Consumption by Country in 2018. Kirin Beer University Report. Retrieved from: https://www.kirinholdings.co.jp/english/news/2019/1224_01.html [accessed 20.04.2021].
16. Perkowska, A., Gromada, A., Golonko, M. (2019). Employment, management and marketing in microbreweries in Poland. In: International scientific-practical conference. Institute of Innovative Education, Kyiv, pp. 16-22.
17. Pokrivčák, J., Lančarič, D., Savov, R., Tóth, M. (2018). Craft beer in Slovakia. In: Economic Perspectives on Craft Beer. Palgrave Macmillan, Cham, pp. 321-343.
18. Smoluk-Sikorska, J., Kalinowski, S. (2011). The economic significance of the brewing sector in the European Union. Acta Scientiarum Polonorum. Oeconomia, 10 (4), pp. 117-129.
19. Statista (2021). Global market share of the leading beer companies in 2020, based on volume sales. Retrieved from: https://www.statista.com/statistics/257677/global-market-share-of-the-leading-beer-companies-based-on-sales [accessed 20.04.2021].
20. Wojtyra, B., Grudzień, Ł., Lichota, J. (2020). The (R)evolution of the Craft Beer Scene in Poland After 2010. In: N. Hoalst-Pullen, M. Patterson (Eds) The Geography of Beer. Springer, Cham. https://doi.org/10.1007/978-3-030-41654-6_5
21. Wojtyra, B., Kossowski, T.M., Březinová, M., Savov, R., Lančarič, D. (2020). Geography of craft breweries in Central Europe: Location factors and the spatial dependence effect. Applied Geography, 124, 102325. https://doi.org/10.1016/j.apgeog.2020.102325
22. World Bank (2020). Labor force, total (ID: SL.TLF.TOTL.IN). Retrieved from: https://data.worldbank.org/indicator/SL.TLF.TOTL.IN [accessed 20.04.2021].

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COMPARISON OF THE LIFE STANDARDS OF INHABITANTS IN EASTERN AND WESTERN POLAND

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ABSTRACT

The main aim of the study is to analyse and compare the quality of life of the inhabitants of eastern and western Poland. This is accomplished by investigating whether the division of Poland into 'Poland A' and 'Poland B', which has been the norm for years, is valid. The spatial scope applies to all voivodeships. The criterion for the division of eastern and western Poland was adopted based on the historical division along the Vistula river. The characteristics used in the analysis described: education, access to medical care, health, safety, housing, the labour market, culture, and material resources. The period examined in the study covers the years 2005–2015. The study used Ward's and taxonomic methods, in particular the Hellwig's method.

Key words: living standard, multi-dimensional statistical analysis, Hellwig's synthetic measure
JEL codes: O11, R11, R58

INTRODUCTION

The study aims to analyse and compare the quality of life of the inhabitants of eastern and western Poland. This should confirm whether or not the division of Poland into 'Poland A' and 'Poland B', which has been applied for years, is valid. The research covers the years from 2011 to 2016. This study makes several contributions to the existing knowledge base in the following ways. Firstly, it is important to determine the differences between the regions in terms of certain aspects of social development, as well as grouping the regions according to the quality of life of their inhabitants. Secondly, the results of the study may be a useful starting point for the performance of feedback analyses and the foundation for decision-making in the economic field. Finally, given that the data are internationally comparable, we provide evidence concerning international differences in living standards.

At present, research concerning quality of life began after the Second World War. During this time, a transformation occurred in many areas. From the 1950s onwards, quality of life was considered at an interdisciplinary level, i.e. in various scientific fields. In the 1960s and 1970s, the concept was for the most part defined quantitatively. This was mainly applicable to research dealing with the satisfaction of both individual and non-individual needs. In the 1970s and 1980s, the main emphasis was placed on certain scientific fields such as sociology and psychology. Observations were initiated examining how certain lifestyles could affect the overall quality of life. Since then, for example, initial studies have been conducted

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to determine the relationships influencing the overall health condition and the standard of living experienced by the examined population. Even though for many years it has been a topic that has been studied by scientists and its popularity is constantly growing, it is still not possible to adopt an unambiguous definition of quality of life (Kowalewska et al., 2017).

It is important to note that there are many factors by which we can measure the level of the quality of life. There are many types of scales with which we can study these relationships. Some of the main factors that may influence the quality of life are material situation, health, material stability and security, family life, community life, climate and geography, employment security, political freedom, gender balance (Grzega, 2012).

THEORETICAL BACKGROUND

Typological procedures and taxonomic methods are used in almost every field of science (Balan and Jaba, 2011; Lee and Willcox, 2014; Löster, 2017; Al-Nofli, 2018). Quality of life in the work process is defined as the effects of the service conditions on the workshop cows. It is very important in this team whether they are perceived as permitting and producing effects, and authorization for management participatory (Skrzypek, 2001). Determining the standard of living of given individual units is possible by determining the ratio of its needs to the state of resources to satisfy them. The quality of human life is evidenced by the accompanying mental states in the process of satisfying needs, as a result of the cognitive assessment of the relationship between with oneself and the environment, assessment of own achievements, failures and the assessment of action of one's aspirations, desires, and life goals (Chudzicka, 1995). In practice, one of the most commonly used discrimination methods of features based on a correlation coefficients matrix is a parametric method, as proposed by Zdzisław Hellwig (Nowak, 1990) this was based on a method that was originally proposed by Hellwig (Hellwig, 1968. The research was conducted in the following stages (Pomianek, Chrzanowska and Bórawski, 2013): Stage 1: A set of variables was chosen and defined; Stage 2: A taxonomic development measurement was created using the Hellwig method; Stage 3: A ranking of the voivodeships was established and they were divided into classes. The levels of the voivodeships will be determined and compared using Ward's method and the method of determining the taxonomic measure of development (TMD) by Hellwig (Pawlas, 2013). The implementation of Hellwig's taxonomic measure of development is widely used in comparative research (Pawlas, 2017). Cluster analysis is one of the multidimensional methods that allows for observations to be classified. Ward's method is one of the agglomeration grouping methods. It was applied using the square of the Euclidean distance. This is a classic method and one of the most widely used methods in cluster analysis. This method is the most highly recommended one due to the applied efficiency criterion of presenting the actual data structure.

MATERIALS AND METHODS

The work adopts the territorial division of Poland based on the established division of the country into Poland 'A' and Poland 'B'. The genesis of this division probably arose during the partitions. There were clear differences between the Prussian territories and the Austrian and Russian territories (Bukowski et al., 2017). The study aims to conduct a comparative analysis of the living standards of the inhabitants of eastern and western Poland, using the data from 2005–2015 from the Central Statistical Office and with the help of taxonomic methods a grouping procedure of the districts has been carried out concerning the similarity of the level of the features under investigation. We focus on the period 2005–2015 because Poland is just after joining the European Union, and in the middle of the period, we are dealing with an economic crisis that could have had a significant impact on the lives of the inhabitants of Poland.

RESEARCH RESULTS AND DISCUSSION

To group voivodeships with similar values in their standard of living, the SPSS Statistics program was used. This allows for the results to be grouped into different levels, so it is possible to evaluate the results

and choose the best combination. A combination was selected that divides the data of individual voivodeships into four clusters. The following variables were adopted (Grzega, 2012; Table 1).

Table 1. Selected variables

Education	
X1	Graduates of studies at the master's level
X2	Number of people who passed matura exams
Access to medical care	
X3	Number of pharmacies
X4	Beds in general hospitals per 10 000
Health	
X5	Number of tuberculosis cases
X6	Infant mortality rates per 1 000 live births
Security	
X7	External causes of illness and death – total number of accidents
Housing	
X8	Average usable floor space per dwelling
X9	Average usable floor space per person
X10	Number of dwellings per 1 000 inhabitants
The labour market	
X11	Average salary
X12	Number of unemployed
Culture	
X13	Radio subscribers
X14	TV subscribers
X15	Viewers in permanent cinemas per 1 000 inhabitants
Material resources	
X16	Total number of passenger cars
X17	Total number of phones

Source: own study.

Hellwig's development measurement, i.e. a synthetic development measurement, is used for the linear ordering of selected diagnostic variables. The synthetic variable replaces the selected diagnostic variables. Table 2 shows the calculated TMD value in 2005 and 2015 for individual provinces. For the names of voivodeships arranged alphabetically, successive ordinal numbers have been assigned: Dolnośląskie – 1, Kujawsko-pomorskie – 2, Lubelskie – 3, Lubuskie – 4, Łódzkie – 5, Małopolskie – 6, Mazowieckie – 7, Opolskie – 8, Podkarpackie – 9, Podlaskie – 10, Pomorskie – 11, Śląskie – 12, Świętokrzyskie – 13, Warmińsko-mazurskie – 14, Wielkopolskie – 15, Zachodniopomorskie – 16.

Over 10 years, we may observe that in the groups created, the composition of voivodeships has not changed significantly. The Mazowieckie Voivodeship is significantly different from the others, so we may conclude that the standard of living in the highest there. The first cluster includes voivodeships with an average standard of living, while the Śląskie Voivodeship changed its position from the fourth cluster to the first over the previous 10 years. In 2015, the Łódzkie Voivodeship increased its standard of living, while in the Podkarpackie and Zachodniopomorskie Voivodeships, we can observe slight changes in the contents of clusters. Based on the research presented, we may conclude that it is difficult to determine unambiguously whether there is a visible division in the living standards of the inhabitants between eastern and western Poland. Based on belonging to certain clusters, we can see that in the third cluster there are voivodeships only from the eastern part of Poland, while as far as the first cluster is concerned, voivodeships from western Poland prevail.

Ward's method is a hierarchical agglomeration method that is used to classify objects. The main criterion by which we choose a pair of linked sets becomes the value that is optimal for a certain objective function. Choices are abundant for the target function. The most frequently used method is the 'sum of the squared deviations of the individual elements of concentration from the centre of gravity of this cluster'. The basic idea of the described method is to combine, at each step of the agglomeration, two such subsets for which the objective function given by the equation is the lowest.

In the following case, a division into four clusters was used (Table 3):

– First voivodeship cluster: Dolnośląskie, Łódzkie, Małopolskie, Wielkopolskie;
– Second voivodeship cluster: Kujawsko-pomorskie, Lubelskie, Pomorskie;
– Third voivodeship cluster: Lubuskie, Opolskie,

Table 2. The taxonomic measure of development values

Specification	Number of voivodship															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TMD1 2005	0.64	0.42	0.31	0.38	0.44	0.5	0.86	0.31	0.46	0.35	0.51	0.67	0.28	0.4	0.51	0.37
TMD1 2015	0.54	0.4	0.45	0.14	0.39	0.3	0.53	0.23	0.3	0.25	0.46	0.34	0.23	0.39	0.57	0.42
TMD2 2005	0.55	0.37	0.25	0.78	0.72	0.4	0.75	0.33	0.59	0.39	0.49	0.54	0.47	0.38	0.29	0.53
TMD2 2015	0.43	0.44	0.31	0.38	0.37	0.7	0.65	0.34	0.43	0.28	0.57	0.28	0.29	0.38	0.71	0.95
TMD3 2005	0.67	0.54	0.5	0.64	0.63	0.5	0.77	0.21	0.31	0.56	0.37	0.53	0.5	0.45	0.46	0.82
TMD3 2015	0.51	0.46	0.5	0.38	0.65	0.3	0.63	0.4	0.49	0.42	0.44	0.98	0.41	0.38	0.5	0.36
TMD4 2005	0.07	0.71	0.93	0.77	0.73	0.6	0.82	0.52	0.79	0.8	0.54	0.81	0.72	0.57	0.66	0.31
TMD4 2015	0.9	0.76	0.95	0.62	0.94	0.8	0.03	0.6	0.76	0.84	0.9	0.34	0.68	0.7	0.83	0.82
TMD5 2005	0.22	0.55	0.63	0.24	0.42	0.6	0.51	0.41	0.39	0.79	0.58	0.71	0.62	0.54	0.75	0.56
TMD5 2015	0.33	0.72	0.54	0.6	0.32	0.7	0.17	0.46	0.89	0.42	0.6	0.47	0.67	0.73	0.59	0.46
TMD6 2005	0.39	0.4	0.46	0.23	0.53	0.2	0.24	0.39	0.37	0.16	0.35	0.25	0.36	0.41	0.26	0.53
TMD6 2015	0.71	0.55	0.44	0.42	0.59	0.6	0.95	0.36	0.37	0.39	0.61	0.86	0.36	0.4	0.75	0.51
TMD7 2005	1	0.53	0.62	0.57	0.63	0.4	0.44	0.39	0.36	0.39	0.35	0.52	0.64	0.71	0.38	0.76
TMD7 2015	0.71	0.55	0.44	0.42	0.59	0.6	0.95	0.36	0.37	0.39	0.61	0.86	0.36	0.4	0.75	0.51
TMD8 2005	1	0.44	0.53	0.57	0.63	0.4	0.49	0.37	0.38	0.47	0.38	0.48	0.64	0.69	0.4	0.95
TMD8 2015	0.6	0.47	0.47	0.37	0.52	0.7	1	0.37	0.46	0.36	0.52	0.76	0.37	0.38	0.66	0.36

Source: own study.

Table 3. Affiliation of voivodeships to clusters in 2005

Voivodeship	Number of clusters 4		Number of clusters 3		Number of clusters 2	
	Year of observation					
	2005	2015	2005	2015	2005	2015
Dolnośląskie	1	1	1	1	1	1
Kujawsko-pomorskie	2	2	2	2	2	2
Lubelskie	2	2	2	2	2	2
Lubuskie	3	3	2	3	2	2
Łódzkie	1	2	1	2	1	2
Małopolskie	1	1	1	1	1	1
Mazowieckie	4	4	3	1	1	1
Opolskie	3	3	2	3	2	2
Podkarpackie	3	2	2	2	2	2
Podlaskie	3	3	2	3	2	2
Pomorskie	2	2	2	2	2	2
Śląskie	4	1	3	1	1	1
Świętokrzyskie	3	3	2	3	2	2
Warmińsko-mazurskie	3	3	2	3	2	2
Wielkopolskie	1	1	1	1	1	1
Zachodniopomorskie	3	2	2	2	2	2

Source: own study.

Podkarpackie, Podlaskie, Świętokrzyskie, Warmińsko-mazurskie, Zachodniopomorskie;
- Fourth voivodeship cluster: Mazowieckie, Śląskie.

For 2015, the results are as follows:
- First voivodeship cluster: Dolnośląskie, Małopolskie, Śląskie, Wielkopolskie;
- Second voivodeship cluster: Kujawsko-pomorskie, Lubelskie, Łódzkie, Podkarpackie, Pomorskie, Zachodniopomorskie;
- Third voivodeship cluster: Lubuskie, Opolskie, Podlaskie, Świętokrzyskie, Warmińsko-mazurskie;
- Fourth voivodeship cluster: Mazowieckie.

The general situation in terms of the living standards of the inhabitants of Poland is improving. In some cases, such as education or access to healthcare, the situation has changed significantly in a favourable way. This is a very beneficial phenomenon. Our country strives to equalize the standard of living so that the differences in the standard of living between the Western and Scandinavian countries are as small as possible. Another conclusion produced by the research is the significant increase in the standard of living of the inhabitants of Poland in the analysed years. Over the decade, one may observe how the level of education and access to medical care has improved. The standard of living of the inhabitants of Poland in 2005–2015 may have been additionally influenced by Poland's recent accession to the European Union in 2004 and the financial crisis that took place in 2008.

CONCLUSIONS

The empirical study covers the period of 2005–2010. The specified period includes a global financial and economic crisis. In the analysis, the phenomenon of the regional life standard of the average inhabitant was considered as a multivariate problem. Thus, a taxonomic measurement of development and Cluster analysis was applied. The taxonomic measurement of the development of Hellwig shows a significant differentiation between the various standards of living for the inhabitants of Poland in individual voivodeships at individual levels. To create a synthetic measurement, 17 variables were used. Then the variables were divided into eight groups: education, access to medical care, health, safety, housing, labour market, culture, material resources. Based on two rankings made for 2005 and 2015, we can conclude that no justifiable division of Poland into eastern and western parts exists. The differentiation of voivodeships presented in Table 3 shows that despite the slight advantage of certain western provinces, the division into 'Poland A' and 'Poland B' is only a stereotype. Poland aims to equalize the standard of living in all voivodships, so that the differences in living standards of individual inhabitants were as low as possible.

REFERENCES

1. Al-Nofli, M.A. (2018). An analysis of geography content about geography for living standards in Oman. International Research in Geographical and Environmental Education, 27 (1), pp. 56-68.
2. Balan, C., Jaba, E. (2011). Statistical analysis of the determinants of life expectancy in Romania. Romanian Journal of Regional Science, 5 (2), pp. 25-38.
3. Bukowski, M., Koryś, P., Leszczyńska, C., Tymiński, M. (2017). Rozwój regionalny ziem polskich pod zaborami. Porównanie poziomu produktu brutto per capita na dzisiejszych terenach Polski na przełomie XIX i XX w. (wyniki pierwszych estymacji). Roczniki Dziejów Społecznych i Gospodarczych, 78, pp. 163-198.
4. Chudzicka, A. (1995). Subiektywny obraz świata i obraz siebie jako kategorie pomiaru jakości życia osób bezrobotnych oraz ich oczekiwania wobec pracy. In: A. Bańka, R. Derbis (Eds) Pomiar i poczucie jakości życia u aktywnych zawodowo oraz bezrobotnych. Środkowoeuropejskie Centrum Ekonomii Działania Społecznego, Poznań, pp. 87-96.
5. Grzega, U. (2012). Poziom życia ludności w Polsce: determinanty i zróżnicowania. Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, Katowice.
6. Hellwig, Z. (1968). Zastosowanie metody taksonomicznej do typologicznego podziału krajów ze względu na poziom ich rozwoju oraz zasoby i strukturę wykwalifikowanych kadr. Przegląd Statystyczny, 4, pp. 307-327.
7. Kowalewska, B., Jankowiak, B., Rolka, H., Krajewska-Kułak, E. (Eds) (2017). Jakość życia w naukach medycznych i społecznych. Vol. 1. Uniwersytet Medyczny, Białystok.

8. Löster, T. (2017). Comparison of results of selected clustering methods on real data set. In: The 11th International Days of Statistics and Economics. Conference Proceedings. Libuše Macáková, Melandrium, Prague, pp. 886-896.
9. Nowak, E. (1990). Metody taksonomiczne w klasyfikacji obiektów społeczno-gospodarczych. Polskie Wydawnictwo Ekonomiczne, Warszawa.
10. Pawlas, I. (2013). Zastosowanie wielowymiarowej analizy porównawczej do oceny potencjalnej atrakcyjności inwestycyjnej polskich województw. Studia Ekonomiczne, 172, pp. 162-176.
11. Pawlas, I. (2017). Regional disparities in development based on taxonomic research: A case of Poland. Regional Formation and Development Studies, 23 (3), pp. 86-101.
12. Pomianek, I., Chrzanowska, M., Bórawski, P. (2013). Zróżnicowanie poziomu rozwoju społeczno-gospodarczego obszarów wiejskich województwa warmińsko-mazurskiego na tle kraju według miernika Hellwiga. Zeszyty Naukowe Ostrołęckiego Towarzystwa Naukowego, 27, pp. 442-456.
13. Skrzypek, E. (2001). Ekonomiczne aspekty jakości życia. Problemy Jakości, 1, pp. 8-14.