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Agriculture farms product differentiation assessment in the Czech Republic

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Abstract: Farms generally produce products with low differentiation. To reach an increase in the profit and sales, product differentiation is one of the potential strategies that could be successfully applied. This paper identifies "Intermediate Consumption/Total Output" as a simple and user-friendly indicator for farm product differentiation performance and comparison assessment in the Czech Republic, based on a two-step cluster analysis performed on 1 225 farms with different operating conditions and reproduction process characteristics in the Czech Republic. The data are sourced from Farm Accountancy Data Network (FADN CZ). Four farm clusters based on product differentiation levels are identified and described from the point of view of the production process and conditions. The resulting cluster profiles, in general, indicate the production conditions and process affecting the resulting product differentiation. Nevertheless, farms deliver extraordinary product differentiation values in fields with less favourable conditions and production processes. Those have the potential to be an inspiration for farms with lower product differentiation values. The result of this paper provides hope, less favourable conditions are not a limit for formidable performance. This paper result can be practically applied by anyone aiming to easily identify, evaluate, and compare farm product differentiation levels.

Keywords: cluster analysis; gross farm income; performance; production process; pure effectiveness

The basic entrepreneurial goal is to reach a positive economic result in the long term, and farmers are not excluded. According to Porter (1998), companies apply two types of strategies to achieve a sustainable competitive advantage, capable of increasing profit and revenues. The first is cost leadership, and the second is product differentiation. Both types of strategies could be applied in either a broad or narrow scope (Porter 1998). Product differentiation is one of the best ways to increase revenues and profits for agriculture farms (Hughes 2014; Alvarez et al. 2018). Product differentiation is a response to competitive and profit pressures in agriculture (Phillips and Peterson 2004). That is a cause when we can establish an increasing motivation to apply a product differentiation strategy in the agricultural industry (Grashuis and Magnier 2018).

A successful product differentiation strategy application means product valorisation, i.e. the ability to sell it for a higher price per physical unit than the competitors. There is a variety of farming product differentiation strategy application options. The modern consumer focuses on a product with higher quality, higher added value, traceability, labelling (Clay and Feeney 2019) and convenience character (Sides and Swaminathan 2020). This value-added product is appraised by consumers who will pay higher prices (Sides and Swaminathan

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2020). Another possibility of product differentiation is local food. Consumers like to buy local food because they consider local food healthier, fresher, tastier and environmentally-friendly (Haas et al. 2013). Local food is also used to create an identity and feeling of belonging, which creates a sense of community (Haas and Petz 2017; Pícha et al. 2018). That brings us to another possibility of product differentiation by branding. Many agriculture producers use branding to support and drive product differentiation (Grashuis and Magnier 2018). In fact, everything mentioned above has already been claimed years ago by Chamberlin (1962). According to him, differentiation can be based on a variety of characteristics of the product, such as special packages, patented features, trademarks or tradenames, location, reputation, personal links to customers or a special attitude during the sale (Chamberlin 1962). Regardless, even though this has long been factual evidence, this world of competitiveness and profit pressure is still undiscovered by many agribusinesses (Kennedy et al. 1997), especially by small family farms (Berti and Mulligan 2016).

Product differentiation is positively correlated with profit achievement. Profit volatility is higher in some agricultural sectors than in others. It is affected by price changes, by technical efficiency (Žáková Kroupová 2016), by debt (Stekla and Grycová 2016), by farm size (Slavickienė and Savickienė 2014), by specialization (Vrolijk et al. 2010) and by localization (Maxová and Žáková Kroupová 2016; Balezentis and Novickyte 2018). Product differentiation can be measured by comparing the difference between output and direct costs directly related to specific production – thus, there is potential to compare the level of differentiation of the farm product as a whole. However, the agricultural output value is significantly affected by subsidies.

Czech farms are highly dependent on subsidies (Lososová and Zdeněk 2014; Žáková Kroupová 2016; Urbancová 2018). According to Špička et al. (2009), subsidies serve as a "financial pillow" that increases the farmers' income and expands the capacity of their decision-making. Subsidies also have an impact on the stability of the farmers' income (Špička et al. 2009; Brožová 2011). Nevertheless, subsidies create market imperfections in the long run. Many authors have studied the difference of the effect of subsidies on individual types of farms. For example, crop production has the least dependence on subsidies (Lososová and Zdeněk 2014), organic farms would not be able to generate profit (Brožová 2011; Brožová and Vaněk 2013; Krause and Machek 2018; Hampl 2020) and farms in areas of natural or other specific constraints (ANC) and in mountainous areas would not generate profit at all without subsidies (Maxová and Žáková Kroupová 2016). Vrolijk et al. (2010) state that about 11% of the European Union farms are affected by fluctuations in direct payments. Barnes et al. (2015) state, that in Sweden, for example, 46% of farms are considered viable without subsidies, and in Scotland, the percentage is even higher (80%). According to field conditions, the share of viable farms in the Czech Republic varies from 70% to 76% according to field conditions (Hlavsa et al. 2020). In the Netherlands, Italy and Belgium, there is a share of agricultural subsidies on output lower than 10%, in the Czech Republic less than 20%, in Austria and Slovenia 30%, in Ireland 50% and in Finland above 60% (Vrolijk et al. 2010).

Many authors deal with the efficiency and profitability of Czech farms (Brožová 2011; Machek and Špička 2014; Krause and Machek 2018; Hampl 2020). A widely-used approach measures agricultural production by monetary units such as added value or gross output (Machek and Špička 2014). However, the authors have not seemed to evaluate the effectiveness of gross farm profitability related to total output, eliminating the effects of subsidies, assessing the level of farm product differentiation value and segmenting them on these bases.

MATERIAL AND METHODS

The presented paper's primary goal is to identify a simple and user-friendly indicator for a farm product differentiation performance assessment and comparison without the effect of subsidies in the Czech Republic.

The indicator shall have the potential for a quick-check and comparison of the farm product differentiation conducted by anybody concerned.

A secondary goal is to describe the segment profiles of farms segmented according to product differentiation performance from the perspective of production conditions and resources.

This paper uses a sample of 1 225 farms with different operating conditions and reproduction process characteristics in the Czech Republic, sourced from Farm Accountancy Data Network (FADN CZ 2018), aiming to reach the goals mentioned above.

Niche productions and farming without agricultural land (horticulture, permanent crops, pigs and poultry) are excluded.

Definitions of the key variables applied in the paper are available in Table 1.

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Table 1. Definition of key variables

Variable	Definition
Total Output	total of output of crops and crop products, livestock and livestock products and of other output = sales and use of (crops and livestock) products and livestock + change in stocks of products (crops and livestock) + change in valuation of livestock – purchases of livestock + various non-exceptional products
Output Crops and Crop Products	total of output of crops and crop products = sales + farm use + farmhouse consumption + (closing valuation – opening valuation)
Output Livestock and Livestock Products	livestock production + change in livestock value + animal products
Other Output	leased land ready for sowing, receipts from occasional letting of fodder areas, agistment, forestry products, contract work for others, hiring out of equipment, interest on liquid assets necessary for running the holding, receipts of tourism, receipts relating to previous accounting years, other products and receipts
Balance Current Subsidies and Taxes	subsidies and taxes arising from current productive activity in the accounting year; balance of subsidies and taxes on current operations
Intermediate Consumption	total specific costs (including inputs produced on the holding) and overheads arising from production in the accounting year = specific costs + overheads
Specific Costs	crop-specific inputs (seeds and seedlings, fertilisers, crop protection products, other specific crop costs), livestock-specific inputs (feed for grazing stock and granivores, other specific livestock costs) and specific forestry costs
Farming Overheads	supply costs linked to production activity but not linked to specific lines of production
Gross Farm Income	output – intermediate consumption + balance current subsidies and taxes

The key variables applied in the paper relations are visualised in Figure 1
Source: European Commission (2020)

$$\text{Pure Effectiveness} = \frac{\text{Gross Farm Income} - \text{Balance Current Subsidies and Taxes}}{\text{Total Output}} \quad (1)$$

The Pure Effectiveness indicator [Equation (1)] is used to evaluate product differentiation (Chocholoušek and Huml 2019).

Pure Effectiveness is calculated for each individual farm, and the farms are distributed into four groups (quartiles) according to the Pure Effectiveness level.

A two-step cluster analysis is conducted using IBM SPSS Statistics software, version 26, release 26.0.0.0, aiming to reach the paper goals specified above.

This approach combines classical relocation and hierarchical clustering methods and is suitable for large data sets of both continuous and categorical variables. Conducted two-step cluster analysis applies likelihood distance and follows the approach of Stehlik-Barry and Babinec (2017). The analysis is primarily conducted in automatic mode to tentatively identify a number of potential clusters and consequently with a specified number of clusters aiming to reach the best cluster quality results – silhouette measure of cohesion and separation.

RESULTS AND DISCUSSION

Six variables, assessing the "top-line" of the farm reproduction process, are used for clustering with reasonable statistical significance. These variables are used for a simple and user-friendly farm performance assessment without the subsidy effect segment indicator definition.

The resulting cluster distribution is described in Table 2. The cluster analysis generated four clusters. Each cluster represents approximately an equal number (*N*) of farms.

Cluster number four represents the segment of farms reaching the highest Pure Effectiveness values. On the

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Table 2. Cluster distribution

Cluster	*N*	Combined (%)	Total (%)
1	307	25.06	25.06
2	305	24.90	24.90
3	306	24.98	24.98
4	307	25.06	25.06
Combined	1 225	100.00	100.00

Source: Authors' calculations based on FADN CZ (2018)

other hand, cluster number one represents the farms with the lowest Pure Effectiveness values. The centroids of the aforementioned variables and clusters are presented in Table 3.

The cluster analysis identifies clusters with internal homogeneity (cohesion) and external heterogeneity (separation). It means cluster members have similar characteristic values within the cluster, but different characteristic values compared to other clusters.

The silhouette measure of cohesion and separation indicator is a popular measure used to evaluate the quality (i.e. level of cohesion and separation) of clusters, identified with a cluster analysis (Norušis 2011).

According to IBM SPSS Statistics software version 26, silhouette measure of cohesion and separation values above 0.5 signify good results of clustering in the area of cohesion and separation. The presented analysis leads to the value of 0.7, i.e. a good result.

The ratio of sizes (Table 4) indicates the ratio between the size of the smallest and the largest clusters. The presented analysis leads to the value 1.01, i.e. the sizes of resulted clusters are very similar.

Predictor importance values are used for ranking variables from most to less important from the clustering point of view (Norušis 2011).

The predictor importance value for each variable used in the cluster analysis is described at the top of Table 5.

Intermediate Consumption/Total Output achieves the highest predictor importance. Intermediate Consumption is the sum of Specific Costs and Farming Overheads, i.e. it cumulates variables ranking at the second and third place of predictor importance (Figure 1 describes the relations among variables). The remaining and lower ranking variables are related to the reproduction process input, i.e. the average working unit (AWU) and hectare. Their predictor importance values are significantly lower than Intermediate Consumption/Total Output.

Table 5 summarises the primary paper goal results, i.e. identifying a simple and user-friendly indicator for farm product differentiation assessment and comparison with reasonable statistical significance (cluster distribution, silhouette measure of cohesion and separation, ratio of sizes, predictor importance). Predictor importance values are combined with a basic statistical description of the variables in Table 5.

Specific Pure Effectiveness values for each cluster have been added to Table 5. There is no predictor importance value for this indicator because it is not directly used for clustering. However, this variable value

Table 3. Centroids

Variable	Characteristic	Cluster				
		1	2	3	4	combined
Pure Effectiveness/AWU	mean	–0.19	0.05	0.07	0.18	0.03
	SD	0.28	0.08	0.09	0.17	0.22
Farming Overheads/Total Output	mean	0.66	0.34	0.29	0.23	0.38
	SD	0.33	0.10	0.08	0.07	0.25
Intermediate Consumption/ Total Output	mean	1.32	0.84	0.71	0.55	0.86
	SD	0.42	0.05	0.03	0.09	0.36
Specific Costs/Total Output	mean	0.65	0.50	0.42	0.32	0.47
	SD	0.21	0.10	0.08	0.08	0.18
Gross Farm Income/ha (EUR)	mean	446.90	692.30	893.74	1169.99	800.83
	SD	233.95	316.95	381.55	987.81	624.13
Farm Net Added Value/ha (EUR)	mean	263.42	508.68	683.41	940.91	599.18
	SD	233.26	266.20	335.27	819.29	537.03

AWU – average working units

Source: Authors' calculations based on FADN CZ (2018)

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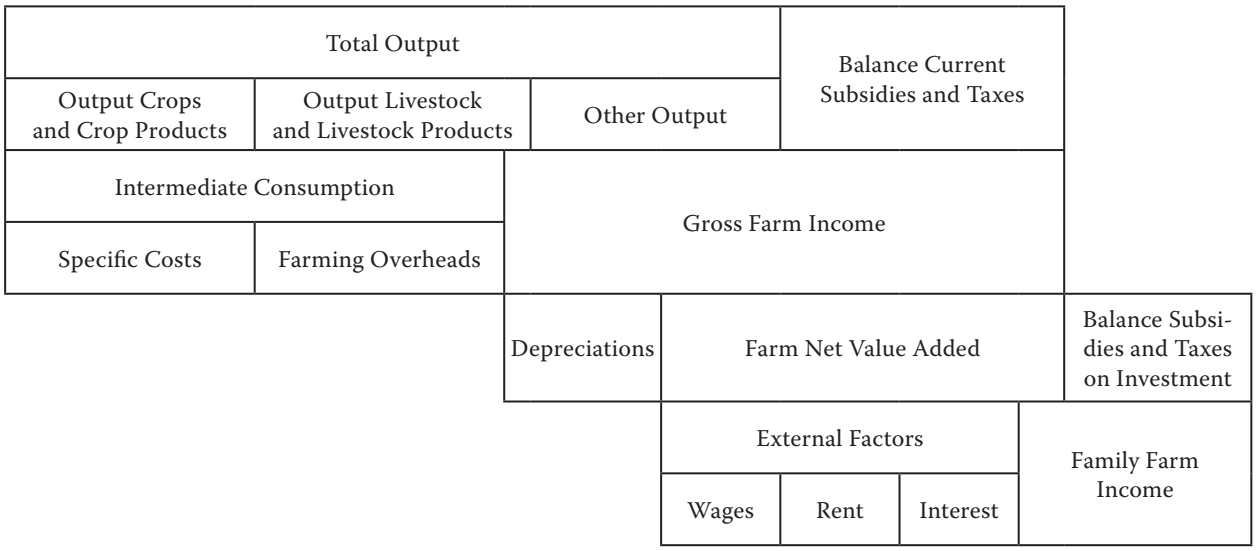

Figure 1. Standard Farm Accountancy Data Network output structure

Source: FADN CZ (2018)

can be directly used for a farm product differentiation assessment. Intermediate Consumption/Total Output represents an additional applicable indicator for farm product differentiation assessment, with 0.86 predictor importance. Concerned users can apply indicators from left to right with declining predictor importance (i.e. reliability) for assessing farm product differentiation without the effect of subsidies.

Since the Intermediate Consumption/Total Output computation is easier and this indicator directly covers two indicators with predictor importance following the highest values, the authors primarily recommend this indicator for farm product differentiation assessment. Other indicators have the potential for a more precise assessment when additional farm data are available.

The secondary goal results (to describe the resulting cluster profiles of farms segmented according to product differentiation from the perspective of production conditions and resources) are summarised in Table 6.

For assessing cluster member operational and production conditions, variables are used that do not lead to the delivery of cluster analysis results with reasonable statistical significance when clustering. However, they are computed for each cluster member as part of a cluster analysis and have potential to be used at least indicatively. Table 6 covers the variable frequency percentage split within clusters.

Table 4. Ratio of sizes

Indicator	Value
Size of smallest cluster (number of farms)	305
Size of largest cluster (number of farms)	307
Ratio of sizes (largest cluster to smallest cluster)	1.01

Source: Authors' calculations based on FADN CZ (2018)

Farm size, specialisation, ANC areas and non-ANC areas are affecting farming profitability (and product differentiation) according to many authors (Vrolijk et al. 2010; Slavickienė and Savickienė 2014; Maxová and Kroupová 2016; Stekla and Grycová 2016; Žáková Kroupová 2016). Field cropping and horticulture reach higher profitability (and product differentiation) and growth than other farms (Balezentis and Novickyte 2018). Nevertheless, farms facing a less favourable production process and conditions can develop high product differentiation levels (Table 6). The indication of high product differentiation in such conditions indicates extraordinary performance potential and probably the best practice resource for other farms to reapply.

When aiming to select the farm delivering extraordinary results in product differentiation values in the less favourable production process and conditions, the potential application of the paper results could be the following:

i) Check if the "Intermediate Consumption/Total Output" value is higher than 0.49 (0.58 – 0.09, i.e. mean – SD), then apply additional indicators from Table 5, if needed.

ii) Check the variable value for farms in Table 6. In this case, this value is against a trend (e.g. grazing livestock type of farming) – this farm is delivering excellent product differentiation results.

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Table 5. Indicators for farm product differentiation and comparison assessment

Cluster	Characteristic	Variable (predictor importance)						
		Pure	Intermediate Consumption/ Total Output (0.86)	Specific Costs/ Total Output (0.55)	Farming Overheads/ Total Output (0.53)	Pure Effectiveness/ AWU (0.40)	Farm Net Added Value/ ha (EUR) (0.20)	Gross Farm Income/ ha (EUR) (0.17)
1	mean	–0.33	1.32	0.65	0.66	–0.19	263.38	446.84
	median	–0.17	1.14	0.64	0.58	–0.07	266.97	433.33
	SD	0.43	0.42	0.21	0.33	0.28	233.23	233.92
2	mean	0.15	0.84	0.50	0.34	0.05	508.61	692.21
	median	0.15	0.84	0.50	0.33	0.02	456.42	600.28
	SD	0.05	0.05	0.10	0.10	0.08	266.16	316.91
3	mean	0.28	0.71	0.42	0.29	0.07	683.32	893.62
	median	0.28	0.72	0.43	0.29	0.02	637.44	816.47
	SD	0.03	0.03	0.08	0.08	0.09	335.22	381.49
4	mean	0.44	0.55	0.32	0.23	0.18	940.78	1 169.83
	median	0.42	0.58	0.33	0.23	0.15	738.24	917.03
	SD	0.09	0.09	0.08	0.07	0.17	819.18	987.67

AWU – average working units

Source: Authors' calculations based on FADN CZ (2018)

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Table 6. Variables frequencies percentage split within clusters

Variable	Value	Cluster (%)				
		1	2	3	4	total
ANC according to the EU	mountain	32.6	15.7	10.1	8.8	16.8
	not mountain	0.0	43.6	43.5	40.1	31.8
	not in ANC area	67.4	40.7	46.4	51.1	51.4
International economic size	small (class 1–6)	43.3	11.5	11.4	16.9	20.8
	medium (class 7–9)	41.7	40.0	26.5	53.1	40.3
	large (class 10–11)	6.2	10.2	10.5	13.0	10.0
	very large (class 12–14)	8.8	38.4	51.6	16.9	28.9
Legal form	individual farm	73.3	44.3	37.3	70.7	56.4
	legal entity	26.7	55.7	62.7	29.3	43.6
Growing region	beet	14.0	32.5	39.9	44.3	32.7
	corn	2.3	4.3	3.6	5.2	3.8
	mountain region	20.8	7.9	4.2	3.3	9.1
	potato	38.1	39.7	35.9	33.9	36.9
	potato-oat	24.8	15.7	16.3	13.4	17.6
Region	Brno	3.6	5.9	8.5	8.1	6.5
	Budějovice	13.7	11.5	10.1	5.5	10.2
	Hradec Králové	8.5	6.6	7.5	8.5	7.8
	Jihlava	13.0	13.8	13.7	10.7	12.8
	Karlovy Vary	3.3	1.0	0.3	1.6	1.6
	Liberec	1.6	2.0	3.6	3.3	2.6
	mid-Bohemian	8.5	19.7	21.9	25.1	18.8
	Olomouc	5.2	8.2	8.2	5.9	6.9
	Ostrava	7.2	6.9	8.2	9.8	8.0
	Pardubice	14.7	7.5	5.6	7.2	8.7
	Plzeň	8.5	5.6	2.9	5.5	5.6
	Ústí nad Labem	5.9	6.9	6.2	5.5	6.1
	Zlín	6.5	4.6	3.3	3.3	4.4
Type of farming	field crops	16.0	36.4	38.2	59.0	37.4
	grazing livestock	59.3	12.5	8.2	6.8	21.7
	milk	3.3	10.8	11.4	11.7	9.3
	mixed	21.5	40.3	42.2	22.5	31.6

ANC – areas of natural or other specific constraints
Source: Authors' calculations based on FADN CZ (2018)

CONCLUSION

Pure Effectiveness is an indicator used to assess the product differentiation level and comparison of farms from 2018 FADN data (FADN CZ 2018).

Intermediate Consumption/Total Output is a simple and user-friendly indicator for a farm product differentiation performance and comparison assessment in the Czech Republic, resulting from a two-step cluster analysis with 0.86 predictor importance. Additional helping indicators are defined to be used as needed.

Four farm clusters are identified based on their product differentiation level with reasonable statistical significance.

Each cluster profile is described from the perspective of their production process and conditions.

The resulting cluster profiles, in general, indicate that the production conditions and process are affect-

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ing the resulted product differentiation. Nevertheless, there are farms delivering extraordinary product differentiation values with a less favourable production process and field conditions. Those have the potential to be a source of best practices for farms with lower product differentiation values.

The results of this paper provide hope that less favourable conditions are not a limit for formidable performance.

This paper result can be practically applied by anyone aiming to easily evaluate and compare farm product differentiation levels. Since the FADN methodology is commonly used in the EU countries, the paper result has the potential to be used within the EU; however, concrete values shall be calculated for each country individually.

REFERENCES

Alvarez A., García-Cornejo B., Pérez-Méndez J.A., Roibás D. (2018): The profitability of value-added products in dairy farm diversification initiatives. Spanish Journal of Agricultural Research, 16: 1–8.

Balezentis T., Novickyte L. (2018): Are Lithuanian family farms profitable and financially sustainable? Evidence using DuPont model, sustainable growth paradigm and index decomposition analysis. Transformations in Business & Economics, 17: 237–254.

Barnes A.P., Hansson H., Manevska-Tasevska G., Shrestha S.S., Thomson S.G. (2015): The influence of diversification on long-term viability of the agricultural sector. Land Use Policy, 49: 404–412.

Berti G., Mulligan C. (2016): Competitiveness of small farms and innovative food supply chains: The role of food hubs in creating sustainable regional and local food systems. Sustainability, 8: 1–31.

Brožová I. (2011): The economic performance analysis of organic farms in the Czech Republic. Agricultural Economics – Czech, 57: 240–246.

Brožová I., Vaněk J. (2013): Assessment of economic efficiency of conventional and organic agricultural enterprises in a chosen region. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 61: 297–307.

Chamberlin E.H. (1962): Theory of Monopolistic Competition: A Re-Orientation of the Theory of Value. 8th Ed., Vol. 38. Cambridge, USA, Harvard University Press: 1–56.

Chocholoušek M., Huml J. (2019): Farmers business scale relation with product differentiation in the Czech Republic. In: Proceedings of 28th International Scientific Conference Agrarian Perspectives XXVIII, Prague, Czech Republic, Sept 18–19, 2019: 75–82.

Clay P.M., Feeney R. (2019): Analysing agribusiness value chains: A literature review. International Food and Agribusiness Management Review, 22: 31–46.

European Commission (2020): Definition of Variables. European Commission. Available at https://ec.europa.eu/agriculture/rica/definitions_en.cfm (accessed Sept 16, 2020).

FADN CZ (2018): FADN CZ 2018 Data. [Unpublished Raw Data]. Farm Accountancy Data Network.

Grashuis J., Magnier A. (2018): Product differentiation by marketing and processing cooperatives: A choice experiment with cheese and cereal products. Agribusiness, 34: 813–830.

Haas R., Sterns J., Meixner O. (2013): Do US consumers perceive local and organic food differently? Journal on Food System Dynamics, 4: 214–226.

Haas R., Petz M. (2017): Introduction to the food chain. In: Grunert K.G. (ed.): Consumer Trends and New Product Opportunities in the Food Sector. Wageningen, the Netherlands, Wageningen Academic Publishers: 83–101.

Hampl F. (2020): A statistical analysis of the financial performance of organic and conventional farms in the Czech Republic with respect to their size. Agricultural Economics – Czech, 66: 1–9.

Hughes D. (2014): European food marketing: Adding value in mature food markets through market segmentation and product differentiation. EuroChoices, 13: 20–26.

Hlavsa T., Spicka J., Stolbova M., Hlouskova Z. (2020): Statistical analysis of economic viability of farms operating in Czech areas facing natural constraints. Agricultural Economics – Czech, 66: 193–202.

Kennedy P.L., Harrison R.W., Kalaitzandonakes N.G., Peterson H.C., Rindfuss R.P. (1997): Perspectives on evaluating competitiveness in agribusiness industries. Agribusiness, 13: 385–392.

Krause J., Machek O. (2018): A comparative analysis of organic and conventional farmers in the Czech Republic. Agricultural Economics – Czech, 64: 1–8.

Lososová J., Zdeněk R. (2014): Key factors affecting the profitability of farms in the Czech Republic. AGRIS On-Line Papers in Economics and Informatics, 6: 21–36.

Machek O., Špička J. (2014): Productivity and profitability of the Czech agricultural sector after the economic crisis. WSEAS Transactions on Business and Economics, 11: 707–717.

Maxová J., Žáková Kroupová Z. (2016): Profitability and efficiency of Czech dairy farms in LFAs. Ekonomická Revue – Central European Review of Economic Issues, 19: 25–34.

Norušis M.J. (2011): IBM SPSS Statistics 19 Statistical Procedures Companion. New York, USA, Prentice Hall: 396–398.

Phillips B.J.C., Peterson H.C. (2004): Product differentiation and target marketing by agricultural producers. Journal of the ASFMRA, 2004: 64–74.

https://doi.org/10.17221/442/2020-AGRICECON

Pícha K., Navrátil J., Švec R. (2018): Preference to local food *vs*. preference to "national" and regional food. Journal of Food Products Marketing, 24: 125–145.

Porter M.E. (1998): Competitive Strategy: Techniques for Analysing Industries and Competitors. New York, USA, The Free Press: 3–33.

Sides R., Swaminathan N. (2020): 2020 Retail Industry Outlook: Convenience as a Promise. Deloitte. Available at https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consumer-business/us-retail-industry-outlook-2020-final-100720.pdf (accessed Nov, 2020).

Slavickienė A., Savickienė J. (2014): The evaluation of small and medium farms' economic viability in the new EU countries. Journal of International Scientific Publications, 8: 843–855.

Stehlik-Barry K.; Babinec A.J (2017): Data Analysis with IBM SPSS Statistics: Implementing data modeling, descriptive statistics and ANOVA. Birmingham, England, Pack Publishing Ltd.: 351–390.

Špička J., Boudný J., Janotová B. (2009): The role of subsidies in managing the operating risk of agricultural enterprises. Agricultural Economics – Czech, 55: 169–179.

Stekla J., Grycová M. (2016): The relationship between profitability and capital structure of the agricultural holdings in the Czech Republic. Agricultural Economics – Czech, 62: 421–428.

Urbancová H. (2018): Profitability in Czech agricultural enterprises. In: Bryła P. (ed.): Managing Agricultural Enterprises. Cham, Germany, Springer International Publishing: 133–144.

Vrolijk H.C.J., Bont C.J.A.M. de, Blokland P.W., Soboh R.A.M.E. (2010): Farm Viability in the European Union: Assessment of the Impact of Changes in Farm Payments. Hague, the Netherlands, LEI: 15–53.

Žáková Kroupová Z. (2016): Profitability development of Czech dairy farms. Agricultural Economics – Czech, 62: 269–279.

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