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received: 20.12.2019
acceptance: 05.02.2020
published: 20.03.2020

Annals PAAAE • 2020 • Vol. XXII • No. (1)

JEL codes: Q01, Q13, Q18

DOI: 10.5604/01.3001.0013.7954

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SHORT FOOD SUPPLY CHAINS AND THEIR IMPACT ON IMPROVING FARM PERFORMANCE AS PERCEIVED BY FARMERS KEEPING NATIVE BREEDS¹

Key words: short food supply chains, native breeds of animals, products of animal origin

ABSTRACT. The main aim of the research was to assess the possibility of improving the functioning of farms as a result of using short food supply chains to offer products obtained from native breeds of animals. The study was conducted in 2017 and involved 144 farms selected on purpose, with animals of native breeds such as cattle, sheep and pigs. The territorial scope of the research covered the Lubelskie, Małopolskie and Podkarpackie province. The method of direct interview (PAPI) was used to obtain information. The use of short supply chains for the sale of farm produced food has positive effects. Farmers see the greatest benefits in improving farm functioning in such business areas like profitability, integration with other participants of the local market and image change. As food of animal origin on farms is produced and offered to consumers, a transition from the sale of agricultural raw materials to higher added value food products takes place. For farmers, another important area of farm functioning, which benefit from selling food in short supply chains, is the integration links between the farm and other local market players. The integration of actors involved in the production and distribution of food is one of the success factors of such undertakings and contributes to the relationships between sectors of the local economy. The image of the farm belongs to non-material elements which build trust and links with customers and, consequently, decide about the prosperity of the business.

INTRODUCTION

Farmers involved in animal breeding are important market participants, but their role usually consists of selling raw materials to collection points (intermediaries) or processing plants. This results in the considerable simplification and limitation of their participation in the market, especially as they currently have more and more opportunities to sell food produced on farms directly to final consumers. Farmers may introduce food of animal origin to the market as part of one of three activities dedicated to them. The first one is direct sales, but concerns a rather limited range of products of animal origin obtained from

¹ Publication made within the framework of the project “Directions of use and the protection of farm animal genetic resources in sustainable development conditions” co-financed by the National Center for Research and Development as part of the Strategic Programme of Scientific Research and Development Works “Environment, Agriculture and Forestry” – BIOSTRATEG, Contract No. BIOSTRATEG2/297267/14/NCBR/2016.

farms [Journal of Laws, 2015, item 1703]. Marginal, local, and limited activities (MLO), under which farmers may sell both unprocessed and processed products of animal origin [Journal of Laws, 2016, item 451], offer the possibility of expanding the product range. The last type of activity is agricultural retail trade (RHD), which includes the sale of each type of food of animal origin (and non-animal) in the form of unprocessed and processed in a manner other than industrial [Journal of Laws, 2016 item 2159].

Short food supply chains are used to offer food produced on the farm to final consumers. As defined in Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013, these are chains comprising a limited number of business operators engaged in cooperation, bringing local economic development and characterized by close geographical and social ties between producers, processors and consumers.

The shortening of food supply chains has been a growing interest in recent years, both for public authorities, from local government to the EU, farmers and consumers themselves. Short chains can increase flexibility in food supply by complementing long conventional food distribution chains. The level of identification of products offered in them has also improved [Galli, Brunori 2013]. Short supply chains, in addition to the organization and delivery of food, contribute to sustainable food systems and the development of rural areas [Mount 2012]. They are also important in the context of public interests, as they take social aspects and environmental benefits into account [Canfora 2016]. In addition, short food supply chains contribute to economic sustainability and improve public health by increasing consumer knowledge and interest in food, its origin and production methods [Mount 2012]. Emerging new consumer needs for quality and authentic products with unique features may contribute, among others, to the interest in food produced from native animal breeds [Krawczyk, Krupiński 2016]. Such products are related to the area they originate from, its natural and cultural heritage and the knowledge and skills of the people living there [Matysik-Pejas et al. 2017]. Sales of food in short supply channels are popular in Western European countries (e.g. Austria, Germany and Switzerland) [FAAN 2010]. It is dealt with mainly by farmers from small and medium-sized family farms (also organic) or those who make agritourism offers more attractive [Kapała et al. 2015].

RESEARCH MATERIAL AND METHODS

The aim of the presented research was to assess the possibility of improving the functioning of farms as a result of using short food supply chains to offer products obtained from native breeds of animals within direct sales, MLO and RHD. The source material used for analysis and conclusions was primary information obtained in the direct interview method (PAPI), in 2017, in farms selected on purpose. The study involved 144 owners of farms that were beneficiaries of the biodiversity protection programme², with farm animals of native breeds such as cattle, sheep and pigs. The territorial scope of the study covered three provinces of south-eastern Poland (the Małopolskie, Lubelskie and Podkarpackie provinces). The research area was determined by the specific nature of agriculture in these provinces, which is conducive to the keeping of native breeds of animals in small and medium-sized family farms, meeting the initial assumptions of economic, social and ecological sustainability.

² Program for the Protection of Genetic Resources of Farm Animals.

The analysis of empirical material was carried out taking the species of animals kept on farms and the province in which they were located into account. To research the relationship between the variables measured on a nominal scale, the χ^2 independence test was used. It tests the H_0 hypothesis assuming that the researched variables are independent of the alternative H_1 hypothesis concerning their relationship. The χ^2 test is based on a comparison between the observed values obtained in the research and the theoretical values calculated, assuming that there is no correlation between the variables according to the formula:

$$\chi^2 = \sum_{i=1}^k \sum_{j=1}^k \frac{(n_{ij} - \hat{n}_{ij})^2}{\hat{n}_{ij}}$$

where: n_{ij} – observed values, \hat{n}_{ij} – expected values.

The test statistic, assuming the truthfulness of H_0 , has a χ^2 distribution of $(k-1) \cdot (n-1)$ degrees of freedom (df). For the conducted analyses, the significance level (p) of 0.05 was assumed.

RESEARCH RESULTS

The largest share in the sample, amounting to over 36%, was held by farms keeping animals of native breeds from the Lubelskie Province. Farms from the other two provinces constituted about 33% (the Małopolskie Province) and about 31% (the Podkarpackie Province) of the surveyed sample, respectively. Among the surveyed farms, over 51% kept native breeds of sheep and over 35% were involved in breeding dairy cattle. The remaining farms kept pigs, all of which came from the Lubelskie Province.

The area in which more than 72% of surveyed farmers see the greatest potential for improvement in farm performance as a result of direct sales, MLO and RHD is the possibility of increasing farm income. Food sales conducted in short supply channels is a form of increasing farm income and diversifying sources, as well as risk management related to agricultural activity [Kapała et al. 2015]. This is the most expected effect for livestock farmers, as this activity leads to a divergence from the sale of unprocessed agricultural raw materials to food products with a much higher added value. The added value of products can be increased by changes in their physical condition, resulting from processing, as well as in the way the product is produced (e.g. using traditional methods), packaged and sold. As a result, added value remains on the farm and the sale of food, the attractiveness of which is based on known origin, high quality and exceptional characteristics, offers the

Table 1. Structure of the sample of farms keeping native breeds of animals, N = 144

Province	Number	Structure [%]	Animal species	Number	Structure [%]
Lubelskie	52	36.1	Cattle	51	35.4
Małopolskie	47	32.6	Sheep	74	51.4
Podkarpackie	45	31.3	Pigs	19	13.2

Source: own research

prospect of an improvement in the economic situation of farms [Kania, Musiał 2017]. The increase in farm income in a given area is also a beneficial phenomenon in the scale of the local economy. It contributes to the so-called multiplier effect, which is a phenomenon of the feedback character. The multiplier effect consists of the influence of one economic activity on the functioning of other enterprises in its environment, because they are a result of additional demand generated by developing entities [Herda-Kopańska 2017].

Farmers also considered integration with other local market players (more than 66% of positive responses) to be an important area that could benefit from the sales of food produced on farms through short supply channels. Links and interactions between different players in local food production and distribution in short supply chains are one factor in the success of such initiatives. Contacts actively created by farms may lead to the establishment of cooperation between farmers and the development of producer groups, integration with the local community of entrepreneurs, and, above all, the consumer community, which is offered food of better quality than industrially produced food. This, in turn, is the basis for building trust between market participants, as short supply chains make it possible to determine the origin and quality of food products [Gołębiewski 2019]. It also implies local development, as it leads to stronger links between local economic sectors, which, by working together, can find new ways to sell products and attract new types of customers.

Farm image is the third area in the hierarchy, which, according to more than 61% of farmers surveyed, benefits from the use of short food delivery channels to sell products through RHD, MLO or direct sales. Food in these channels is characterized by the location of its production. That is why it is so important to create a positive image, being an intangible element of the farm's communication with the market, which is made up of many factors. These include the elements of the appearance of the place of production and sale, but also the qualifications of the farmer [Kondratowicz-Pozorska 2012], the quality of the products offered and the trust and ties with customers that are difficult to quantify. An additional advantage of farms producing products from raw materials obtained from native breeds of animals is the possibility to use a dedicated label "Native Breed" (pol. "Rasa rodzima"). It allows consumers to easily identify products originating from domestic breeding with specific features.

More than half (55%) of respondents believe that, as a result of using short channels of food supply in their contacts with the market, farm innovation may improve. Innovations in farms may be of technical, organizational and/or marketing nature, and innovation may include the introduction of a new production method, the use of new raw materials, the introduction of new products or entering a new market. Introducing innovations determines the development of the holding and also contributes to increasing the level of its competitiveness [Kiełbasa, Puchała 2015].

According to the surveyed farmers, the use of short supply channels by a farm improves the creation and accumulation of knowledge, which, in turn, is related to human capital [Kozera 2010]. According to half of the respondents, both of these areas could gain as a result of RHD, MLO or direct sales. Knowledge, skills and experience often possessed by farmers constitute a potential, which is not fully utilized while running a farm, and can be used to start non-agricultural activity related to food processing. In addition, MLO, RHD and direct sales can be an alternative to the management of surplus human resources not

used on the farm. These reserves may be involved in running additional business activity related to the farm [Parzonko 2016].

Nearly half of the surveyed farmers believe that additional activity conducted on a farm improves its stability in relation to the environment. Diversification of activity forces farmers to become acquainted with and learn about the external environment, which, in consequence, leads to the development of the ability to react appropriately to changes taking place in it. The economic condition of farms depends on the speed of this reaction and its ability to adapt to changed conditions.

The lowest percentage of the surveyed farmers (ca. 47%) indicated an improvement in the use of physical resources of a farm as an area benefitting from the sales of food produced on farms in short supply channels.

Taking the location of farms into account (Table 2), it was found that there was diversity in the assessment made by farmers concerning the improvement of the area related to farm profitability ($\chi^2 = 9.750, p = 0.045$). The highest rate of positive responses was obtained in the Małopolskie Province (almost 83%) and the lowest in the Lubelskie Province (about 58%). The indications of respondents also differed in terms of the perception of the possible impact of the discussed activities and food sales in short distribution channels on the sphere of farm innovation ($\chi^2 = 11.188, p = 0.025$). The most unanimous response concerning this impact were breeders from the Lubelskie Province, among whom the percentage of positive responses was over 63%, while the lowest percentage of positive

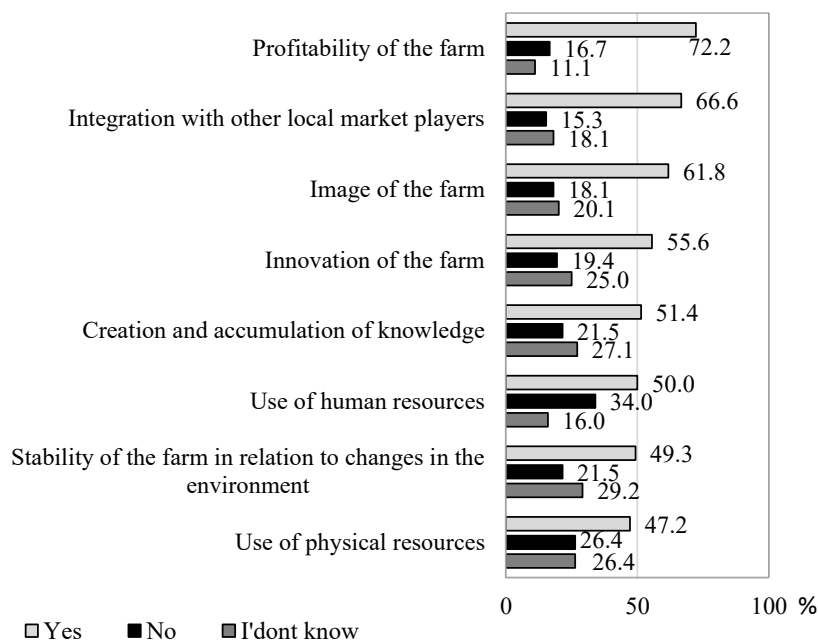


Figure 1. Opportunities to improve farm business areas by using short food supply chains to offer products under direct sales, MLO and RHD as assessed by farmers with native breeds of animals, N = 144

Source: own research

Table 2. Relationship between the assessment of the potential for the improvement of farm business areas through the use of short food supply chains to offer products under direct sales, MLO and RHD and the location of farms with native breeds of animals

Specification	χ^2 value	<i>p</i> -value	The adopted hypothesis
Profitability of the farm	9.750	0.045	H ₁
Integration with other local market players	5.529	0.237	H ₀
Image of the farm	6.074	0.194	H ₀
Innovation of the farm	11.188	0.025	H ₁
Creation and accumulation of knowledge	9.434	0.051	H ₀
Use of human resources	19.325	0.001	H ₁
Stability of the farm in relation to changes in the environment	21.903	0.000	H ₁
Use of physical resources	11.475	0.022	H ₁

Source: own research

responses was recorded among respondents from the Małopolskie Province – less than 41%. Also, the possibilities of improving the areas related to the use of human resources ($\chi^2 = 19.325$, $p = 0.001$) and physical resources ($\chi^2 = 11.475$, $p = 0.022$) as a result of the use of short food supply chains to offer products under direct sales, MLO and RHD were perceived differently among farmers from particular provinces. In both cases, this aspect was most positively assessed by breeders of native breeds from the Podkarpackie Province (68.9% and 60.0%, respectively), while the lowest positive response rates were obtained among breeders from the Lubelskie Province (26.9% and 28.9%, respectively).

Table 3. The relationship between the assessment of the potential for the improvement of farm business areas through the use of short food supply chains to offer products under direct sales, MLO and RHD and the species of animals of native breeds kept on the farm

Specification	χ^2 value	<i>p</i> -value	The adopted hypothesis
Profitability of the farm	8.152	0.086	H ₀
Integration with other local market players	7.770	0.100	H ₀
Image of the farm	7.144	0.128	H ₀
Innovation of the farm	3.773	0.439	H ₀
Creation and accumulation of knowledge	5.300	0.258	H ₀
Use of human resources	5.438	0.245	H ₀
Stability of the farm in relation to changes in the environment	13.673	0.008	H ₁
Use of physical resources	1.348	0.853	H ₀

Source: own research

Verification with the χ^2 independence test demonstrated the importance of differences in the perception of the impact of RHD, MLO and direct sales on the ability to improve the stability of a farm in relation to changes in the environment. This differentiation was observed both in relation to the location of farms ($\chi^2 = 21.903, p = 0.000$) and in relation to the kept animal species ($\chi^2 = 13.673, p = 0.008$) (Table 3). In the first case, the greatest potential for improvement of this area of farm functioning was seen by dairy cattle farmers (60.8%), and the smallest by pig farmers (15.8%). Taking into account the location of farms, the highest positive response rate was recorded among farmers running farms in the Małopolskie Province (72.3%) and the lowest in the Lubelskie Province (28.8%).

In other verified cases, the results of the χ^2 independence test do not allow to reject the H_0 hypothesis indicating no differences between the analyzed variables.

SUMMARY

Nowadays, farmers have more and more possibilities to sell food from farms directly to final buyers. The production of food by farmers keeping animals of native breeds and the sale of food in short supply channels may lead to the creation of new value, at the same time constituting a basis for the creation of a permanent competitive advantage by farms. This advantage is a result of improving various areas of farm functioning, among which farmers see the greatest benefits in improving farm functioning in such business areas like profitability, integration with other participants of the local market and image change. The sale of food of animal origin produced by farmers leads to a diversification of sources of income and gives the chance to increase it. This is a result of offering food products with higher added value than the sale of raw materials. In addition, short food supply chains allow farmers to gain direct access to consumers and take over the margin on which intermediaries otherwise earn. For farmers, an important aspect of action in short supply chains is also expected integration links between the farm and other local market participants. Cooperation between local partners serves to strengthen their market position and is the key success factor in creating and sustaining their business. The opportunity to improve the image of the farm is also important for farmers. The image of the farm belongs to non-material elements, which build trust and links with customers and, consequently, decide about the prosperity of the business. An additional advantage of farms making products from raw materials obtained from animals of native breeds is the possibility of using the designation "Native breeds" (pol. Rasa rodzima). This designation allows consumers to easily identify products with specific features.

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KRÓTKIE ŁAŃCUCHY DOSTAW ŻYWNOSCI I ICH WPŁYW NA POPRAWĘ FUNKCJONOWANIA GOSPODARSTW W OPINII HODOWCÓW UTRZYMUJĄCYCH ZWIERZĘTA RAS RODZIMYCH

Słowa kluczowe: krótkie łańcuchy dostaw żywności, rasy rodzime zwierząt,
produkty pochodzenia zwierzęcego

ABSTRAKT

Głównym celem badań była ocena możliwości poprawy funkcjonowania gospodarstw, jako efektu wykorzystania krótkich łańcuchów dostaw żywności do oferowania produktów pozyskanych od zwierząt ras rodzimych. Badania przeprowadzono w 2017 roku. Uczestniczyły w nich 144 gospodarstwa dobrane w sposób celowy, utrzymujące zwierzęta ras rodzimych, takich jak bydło, owce i świnie. Zasięg terytorialny badań obejmował województwa lubelskie, małopolskie i podkarpackie. Do pozyskania informacji wykorzystano metodę wywiadu bezpośredniego (PAPI). Wykorzystanie krótkich łańcuchów dostaw do sprzedaży żywności wytworzonej w gospodarstwach rolnych niesie za sobą pozytywne skutki. Największe korzyści rolnicy dostrzegają w poprawie funkcjonowania gospodarstw w takich obszarach, jak ich dochodowość, integracja z innymi uczestnikami lokalnego rynku oraz zmiana wizerunku. Dzięki wytwarzaniu żywności pochodzenia zwierzęcego w gospodarstwach i oferowaniu jej konsumentom, następuje odchodzenie od sprzedaży surowców rolniczych na rzecz produktów żywnościowych o wyższej wartości dodanej. Ważnym dla rolników obszarem funkcjonowania gospodarstw, który zyskuje w wyniku sprzedaży żywności w krótkich łańcuchach dostaw, jest oczekiwane przez nich powiązanie integracyjne pomiędzy gospodarstwem a pozostałymi uczestnikami lokalnego rynku. Integracja podmiotów zajmujących się produkcją i dystrybucją żywności jest jednym z czynników sukcesu takich przedsięwzięć, a także przyczynia się do powiązań między sektorami lokalnej gospodarki. Z kolei wizerunek gospodarstwa należy do elementów o charakterze niematerialnym, które budują zaufanie i więzi z klientami, a w konsekwencji także decydują o powodzeniu prowadzonej działalności.

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