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UNCOVERING PRODUCTION FLOWS FROM SMALL FARMS: RESULTS FROM POLAND AND PORTUGAL CASE STUDIES

Key words: small farms, production flows, Portugal, Poland

ABSTRACT. This study is an attempt to assess the impact of small farms (SF) on the regional food product circulation of specific key products in selected, fragmented, agrarian regions in Poland and Portugal. The empirical study is based on the analysis of food product maps which were developed based on data from a survey conducted among owners of small farms and small food businesses at focus group meetings and workshops organized in 2017 and 2018 in the Nowotarski and Nowosądecki subregions in Poland and in the Alentejo Central and Oeste subregions in Portugal. Qualitative data analysis was conducted using uniform methodology. In each of the subregions, focus groups helped to confront the assumptions resulting from surveys and corroborate the flows and fluxes described in the developed food product maps. Data collected during focus groups were enriched by data gathered during regional workshops that focused on food system governance. It was concluded that food product maps indicate interesting relationship flows of small farmers' products along the food system, highlighting the role of fluxes connecting small farmers with other actors regarding specific key products. Several similarities and disparities between regional KP production flows in the Portuguese and Polish subregions, based on the type of key product, the various distribution channels and farming capacities present in each subregion were observed.

INTRODUCTION

Small farms (SF) are still the predominant type of farm in numerous countries and take their place as an important element of the rural economy in many European Union (EU) regions. According to official statistics, of the 10.5 million farms that exist in the EU, 6.6 million are SF [Eurostat 2016]. Small farms play multifunctional roles in rural areas by delivering important goods and services to themselves and their nearest surroundings [Davidova et al. 2012]. Literature highlights that small farms can fulfil a production role (related to food product and food processing capacity), an economic role (considering small farms as a source of income) and an environmental role (referring to their capacity to maintain and develop important environmental elements, including the preservation of the genetic diversity of ancient varieties of animals or horticultural crops). SF also play social roles (small farms as an essential social unit for the definition and cohesion of ru-

ral territories and also as places known for a high quality of life) and traditional-cultural roles (creation and reproduction of culture and traditions of regions in which they reside) [Żmija, Szafrańska 2015, Czekaj, Żmija 2016]. Despite several roles which SF fulfil, their regional importance and their motivations [Davidova, Bailey 2014] continue to arouse much controversy. However, today, an in depth understanding of the idea of the functioning of small farms is still pending. Selected aspects of activities of small farms are not well documented and have not yet been included in official statistics. The list includes food entering informal markets, production for self-provisioning [Schupp, Sharp 2012, Laney, Turner 2015] and food production to nearby SF consumers – family members, neighbours and friends [Balázs 2016]. Also, the flows and actors SF are connected with are not well recognized, as small farmers often work in a so-called grey zone, or the scale of their production is so low that they are not treated as reliable business partners (for instance for food processors) [Berdegué et al. 2008, Milczarek-Andrzejwska 2012]. Bureaucratic procedures are often equally complex for small and large producers and often small farmers are excluded from a variety of circuits. Other circuits are more friendly to SF, such as oil mills, wineries, and producer markets. Fortunately, there are still mechanisms that can facilitate the integration of SF in these agri-food circuits.

The aim of the paper is to assess the impact of small farms (SF) on the regional food product circulation of specific key products in selected, fragmented agrarian regions in Poland and Portugal.

MATERIAL AND METHODS

The presented outcomes are part of the results from the SALSA Project: Small farms, small food businesses and sustainable food and nutrition security. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 677363.

The subject of research presented in this paper is the participation of small farms (SF) in the regional food product circulation of specific key products (KP) in selected agrarian regions in Poland and Portugal with a high share of fragmented small farms. This paper presents the results of studies conducted in four NUTS 3 regions: Nowotarski (NT) and Nowosądecki (NS) subregions in Poland, and Alentejo Central (AC) and Oeste (OE) subregions in Portugal. Despite the distance between these two countries, there are many similarities regarding the subject of agriculture. The average farm size in Portugal and Poland both fall below the average across Europe (16.1 ha average in EU-28 according to Eurostat in 2016). In Portugal, the average land area is 13.8 ha, while in Poland it is 10.1 ha [DG AGRI 2013]. A common characteristic for both countries is the polarity of location, with SF located predominantly in the South of Poland and the North of Portugal, and both have a high share of abandoned, neglected land [Musiał et al. 2015]. Another common feature of farmers from both countries is a reluctance among small farmers to work together and cooperate [Marosz 2013]. Both countries also have problems finding young people to work in agriculture, although the situation in Poland is the best in the EU (12.1% below the age of 35), while in Portugal it is only 2.5% [Eurostat 2013].

Research was conducted in accordance with a uniform research methodology adopted in each of the research regions covered by the SALSA project. In each region, four specific key products (KP) were chosen according to the methodology adopted by the SALSA Project, namely due to their economic, dietary or cultural relevance in each specific region [SALSA Project 2016].

For each KP a circulation scheme was prepared based on a common template (an exemplary scheme is presented in Figure 1). KP maps aim to represent the relative importance of SF producing a particular key product within the food flow and trace the full food chain of production, processing, distribution and consumption. The results from the maps illustrate the main actors involved in the circulation of products who interact with SF and the main nodes and flows of raw or processed products. Big food producers were included on the map only when there was interaction with SF in the regional food system. Arrows represent the flow of products among food chain actors, indicating the type of product (fresh versus processed) and the intensity of the flow is illustrated through the thickness of the arrows.

Maps were prepared on the basis of quantitative data coming from different sources. The primary data source used for preparing the initial version of maps were results of surveys conducted among at least 30 small farmers and at least 10 small food business owners in each of the research region. Sampling was purposeful as interview participants were required to be engaged in production or processing in at least one of the four KP indicated in each research region.

Initial versions of maps, prepared based on the results of the survey, were then verified during focus group meetings organized for each KP (16 meetings, four per each region) and regional workshops (4 workshops, one per each region) conducted in 2017 and 2018. Participants of focus groups and workshops were deliberately chosen actors involved in the regional food system ranging from the production to consumption stage, including small farmers, small food business owners, intermediaries, sectoral experts, civil society members, and representatives of regional administration (i.e. public institutions and non-public entities directly or indirectly involved in activities aimed at ensuring food security in the surveyed subregions). Focus groups served to confirm the results gathered from interviews and corroborate the flows and fluxes described in the developed food product maps. In addition, data from focus groups were enriched by data gathered during regional workshops that focused on food system governance, as well as in relation to specific KP. The research method used during focus group meetings and regional workshops was the method of focused group interviews, including discussions conducted by a moderator (member of the research team), according to a previously developed scenario. Such a method is used in studies in which statistical representativeness is less important and where the aim is to identify patterns of thinking, understanding and evaluation of a given phenomenon [Maison 2001, Nikodemska-Wołowik 2008, Żmija et al. 2018]. Based on obtained data, the final versions of food product maps for 16 products were prepared.

Based on statistical data concerning the area of production yield and number of animals, the total regional production of each key product was estimated. The number of inhabitants of each region and amount of yearly consumption per person were used to estimate total regional consumption. However, it is necessary to stress that the authors do not as-

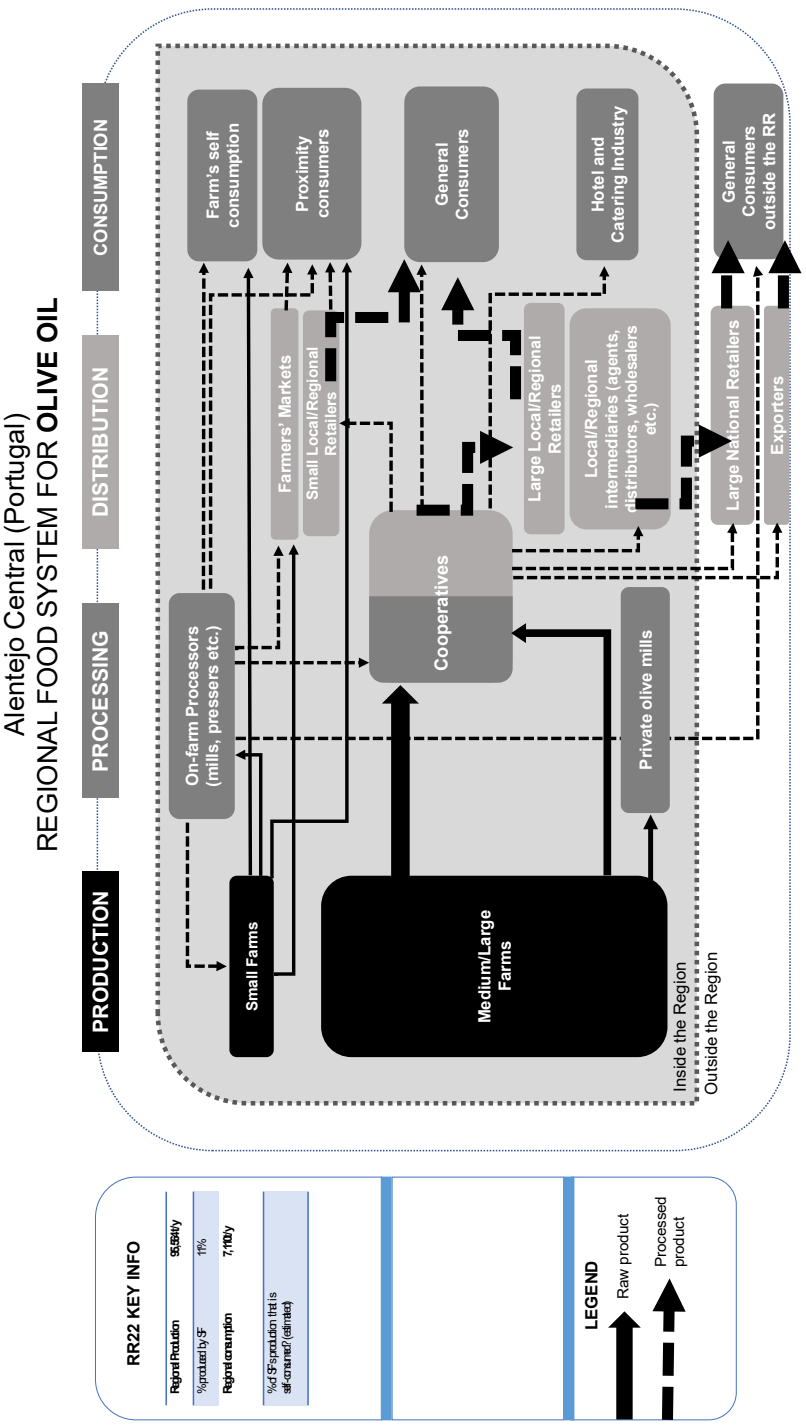

Figure 1. Regional food product map for olive oil in Alentejo Central (Portugal)

Source: Project SALSA reports from the focus group meeting

sume that regional production is designated firstly or only to regional consumption. The, hereby, presented comparisons aimed at showing a wider picture of production capacity at the sub-regional level regarding the availability of food of specific KP in each region, considering only one of the four food security aspects (food availability, food access, food utilization and food stability) [FAO 2006, 2008].

SMALL SCALE FARMING IN SELECTED REGIONS IN PORTUGAL AND POLAND

The Polish and Portuguese regions are representative of quite different characteristics. Polish regions are located in sub-mountainous areas where agricultural production is dominated by small farming and SF represent more than 90% of all farms (Table 1). Such a situation can be explained by the history of the region: inherited farmlands were often split among all children in the family, thus increasing the level of land fragmentation and making it one of the main obstacles for the rationalization and economization of production. Therefore, one farm often consists of many very small plots. Often, the plots are so small that farmers cannot obtain direct payments for them. Also, land fragmentation and environmental handicaps (such as field slopes, short vegetation period, low soil quality) make it difficult to mechanize cultivation.

Although SF do not produce large amounts, food production in some of these farms is specialized. Agricultural food production in NT is low, therefore many different food goods in this sub-region must be imported. Most of the land area in NS is covered by mountainous, upland areas, as well as river valleys, allowing NS to be described as a typically agricultural region. Both Polish regions include numerous nature reserves and parks. They are regions with attractive landscapes that specialize in spa, health and holiday tourism and which bring a large influx of tourists. Annually, approximately 1.9 million tourists visit these regions, often also taking advantage of accommodation and meals at agritourism farms. Another advantage of the region is its location bordering with Slovakia. This situation gives the possibility for SF to cooperate with the Slovakia bordering region and deliver goods to foreign consumers [Czekaj, Tyran 2018a,b].

The Portuguese regions differ geographically, socially and politically from the Polish regions. Alentejo Central is located on a slightly hilly region and mainly consists of Montados, the silvo-pastoral system composed of holm and cork oaks, some shrubs and natural or improved pastures. The climate is Mediterranean, with rains distributed throughout the year. Soil conditions vary throughout this region and are mostly poor in the central area and sandy in the north and east areas of AC. Income from this Montado system, that represents the landscape matrix, is derived mainly from growing cork and raising cattle. The territorial distribution of settlements in AC is concentrated (Table 1), thus small farms, olive groves and vineyards are distributed around these settlements. In the regions, earnings from SF selling cork and cattle are complemented by sales of olive oil, wine and vegetables. Most small farms in AC focus on cultivating olive groves, forage crops, vineyards, cereals, citrus, horticultural crops and fresh fruits. Some of the agricultural output is sold in the nearby capital city (about 1.5 h away), although the economic gain from such sales in the region is not as important as in Oeste.

Table 1. Farms and small farms in research regions in Poland (PL) and Portugal (PT)

Region	Average farm size (ha)	Total number of farms	Total number of farms below 5 ha	Share of SF in number of farms in the region (%)
Nowosądecki (PL)	2.23	57,966	52,944	91.34
Nowotarski (PL)	3.35	45,424	42,448	93.45
Alentejo Central (PT)	76.12	7,412	3,212	43.34
Oeste (PT)	5.22	12,304	9,342	75.93

Source: [GUS 2013, NISP 2009, 2011]

Unlike AC, Oeste is a dynamic region with a vast diversity of territory alternating between urban and rural landscapes and with a relatively high population density in relation to the national average. The blend of urban and rural characteristics provides OE with a calm residential model with reduced traffic congestion, increased social cohesion and traditional economic activities linked to the primary sector. Structurally, OE benefits from being adjacent to the capital city – mainly in terms of accessibility. This close proximity to the capital creates employment opportunities for the growing population, closeness to the national market and advantages in access to external markets, while simultaneously prompting an inflow of foreign tourists. Nevertheless, this advantage also exposes Oeste to the risk of suburbanization to the Metropolitan Area of Lisbon (MAL), thereby causing landscape and environmental degradation as well as increased emigration, especially by young people.

For centuries, OE has been known for its excellence as an agriculture region in Portugal and SF are the norm in this sub-region. Cool summers and mild winters are ideal for the production of many kinds of fruit and vegetables all year-round. The rural feature of Oeste is an identifying trademark that adds competitive value to the region.

FOOD PRODUCT FLOWS IN SELECTED REGIONS IN PORTUGAL AND POLAND

Comparing production and consumption data enabled the estimation of the regional food balance for each key product in each region (Table 2). The significant excess of food production of a specific KP might indicate that this item is primarily intended for export to be sold outside the sub-region (e.g. in NS apples, NT lamb, AC tomatoes, wine, olive oil and lamb, and OE wine and pears). In contrast, a moderate difference between regional production and consumption might indicate a particular KP is likely to be composed of fluxes remaining within the regional food flow. Significantly, among the 16 KP studied in these four sub-regions, milk and cereal production in NT and NS regions and potatoes in the NS region are too low to satisfy regional consumption.

An estimated proportion of regional production coming from SF was calculated to identify the contribution of SF to regional production, according to official statistics of food production and the number of small farms. Estimations were then discussed during

Table 2. Estimation of key products regional production and consumption in researched regions in Poland (PL) and Portugal (PT)

Region	Product	Total regional production (ton/year)	Estimated proportion of regional production coming from SF [%]*	Total regional consumption (ton/year)	Balance (produced – consumed)
Nowosądecki (PL)	Apples	105,000	60	15,000	90,000
	Potatoes	51,000	40	55,000	-5,000
	Cereals	32,600	10	57,800	-25,200
	Milk	100,000	40	110,000	-10,000
Nowotarski (PL)	Lamb	250	35	76	174
	Potatoes	56,290	90	38,750	17,540
	Milk	85,345	15	101,956	-16,611
	Cereals	13,335	40	41,436	-28,101
Alentejo Central (PT)	Tomatoes	47,580	1	828	46,752
	Lamb	7,424	15	234	7,190
	Olive oil	95,564	1	7,110	88,454
	Wine	77,522	30	7,234	70,288
Oeste (PT)	Wine	860,773	30	182,380	678,393
	Pear	167,186	21	42,997	124,189
	Eggs	8,013	2	3,091	4,922
	Potatoes	38,628	56	33,358	5,270

Source: * [Czekaj, Tyran 2018a,b, Fonseca 2018, Hernández 2018] and [GUS 2013, NISP 2009, 2011, 2015, 2016]

meetings with regional experts, which enabled them to be updated according to the present situation in the surveyed regions. SF production was greater in some regions than in others, depending on the KP studied and the region's specificity. The developed estimation serves solely to show the sectors in which SF contribute most in the region, however, the impact of SF on regional food consumption cannot be withdrawn from this analysis because 'hidden', informal fluxes escape statistics.

For each KP, a regional food product map was prepared, however, a thorough analysis of these is not presented in this paper. Instead, the authors focused on the analysis and comparison of maps by identifying the similarities and differences among them. The idea of a graphic demonstration of the most important actors, nodes for food product flows or for the food system is not new and several examples can be found in literature [Heller et al. 2000]. The comparison is conducted according to core activities of food flows, which include production, processing, distribution (retail and transport) [Bene et al. 2019] and consumption.

According to survey results, SF from all analysed regions designated part of their KP production for self-consumption (directly or after on-farm processing). The only exception were cereals in NT, where the raw material requires processing (milling), which was done

off-farm to produce flour for consumption. The tradition of on-farm processing (milling) of cereals has become increasingly less popular in NT and there are only a limited number of small mills in the region. Cereals in NT and NS regions are usually used for animal feed. The estimated share of KP production designated for self-consumption vary between the regions and products and reach 1% for pears from the OE region, 2% for apples from the NS region, to as much as 80% for potatoes from NS and 90 % for potatoes from NT.

Most SF in analysed regions designated part of their KP production for direct sales. In the KP product maps, this indicates that no intermediaries exist between SF and consumers; thus an arrow directly connects SF to the final consumer. KP can be sold directly to proximity consumers, general consumers and tourists at farm stands and farmer markets or by directly contracting to school canteens as well as actors representing the hotel and catering industry. Fresh fruit and vegetables, such as apples, pears, tomatoes, potatoes, and eggs tend to thrive in direct sale fluxes. In the case of cereals in NS, this KP is not consumed by people but rather used as fodder instead. Patrick Mundler and Sophie Laughrea [2016] argue that direct sales are a strategy used by SF and small food businesses as a commercialization channel that enables them to have larger control over food prices and, thereby, secure greater returns.

Whenever a KP requires processing before consumption, or efforts to increase its value are made, its flow integrates other actors along the food system such as mills and slaughterhouses (e.g. wine grapes, olives, lamb meat). The degree of processing (thus the length of the flux) depends on the product. For instance, lamb meat in AC and NT can only be sold to customers in the nearby proximity according to legal regulations – in AC, this cannot amount to more than 5 animals per SF – and in NT only after slaughter in a slaughterhouse. In AC, most lambs are sold to an intermediary buyer who delivers the animals to the nearest slaughterhouse. Buyers can either sell live animals to a slaughterhouse or afterwards, once it is processed to another intermediary. In NT and NS, raw milk and dairy products are sold directly to family members, friends and acquaintances. The fact that different regions deal with similar problems when selling directly should be stressed. For example, in AC and NT, small farms lack the infrastructure to slaughter animals (lambs) in legal slaughterhouses, either because these are too distant and it is not worth purchasing a vehicle to bring the animals to a slaughterhouse, or due to a lack of cold system for transportation. These restrictions are mainly a matter of lack of sufficient scale, which limits SF's capacity in the food flow. Lambs are often slaughtered on the farm illegally and sold to people, whom the producer trusts will not report them to competent authorities.

Some differences were identified in similar products as well (pears from OE and apples from NS), as they can be delivered directly to customers in different ways. A small portion of pears in OE is sold directly to customers at farmer markets. The majority of pears are sold to producer cooperatives, as SF often have fixed contracts with such coops which later sell them to wholesalers and other distribution channels (e.g. processors for transformation). On the other hand, a fraction of apples from the NS region is sold to consumers in the vicinity, part is subject to on-farm processing (juices, chips) and then sold to consumers in the vicinity, while the rest of apples is sold to other distribution channel chains.

Some of the analysed KP in Poland and Portugal are subject to on-farm processing. In all cases, when products are processed on the farm, at least part of the obtained goods are sold. Lack of on-farm processing was noticed for potatoes in NS, NT and OE, cereals in NT and NS and eggs and pears in OE. For all of these mentioned products, consumers usually look for raw products, therefore there is no need for processing.

For SF to thrive, they must be able to generate sufficient income from their activity, either by relying on other non-agricultural sources of income or by using farm assets and developing profitable activities without direct engagement in agricultural production. For small scale farms to generate sufficient income, usually some form of SF commercialization is required [Pingali et al. 2005]. One common strategy are producer cooperatives. Selected KP are a subject of interest for cooperatives. Cooperatives fulfil an important role for SF and support the process of distribution for wine grapes in AC and OE, milk in NT and NS and fruit in OE and NS. Olives in AC are sold to cooperatives where they are processed. There are cooperatives more dedicated to the transformation of olives from SF, while other cooperatives are more directed towards large-scale production. In most described cases, cooperatives jointly process and distribute products and can serve as a bridge for a KP to enter larger markets. In the case of potatoes in OE, vegetable cooperatives serve mainly as input suppliers and supporting networks but do not focus on commercialization. For example, on a small-scale, they are not efficient enough to guarantee a distribution channel, therefore SF producing potatoes sell mostly directly in farmer markets or market multiple vegetables collectively (i.e. kale, onions, pumpkins, etc.) to wholesalers. In all analysed food product systems, SF coexist (and often cooperate) with big farms. The share of SF production in regional production varies depending on the type of KP. In several analysed food product systems (~60%), KP production represents more than 20% of the total KP regional production.

For certain KP, selling beyond the regional borders has little importance for small farms. Examples are cereals in NT and NS, potatoes in NT and NS, eggs in OE and tomatoes in AC. The opposite is true for KP from SF within food product systems, where it can be observed that they are strongly export (beyond region) oriented (e.g. wine and olives from AC, pear and wine from OE, lamb from NT and apples from NS).

The different pathways of commercialization of KP by SF build resilience and reduce susceptibility to external factors. The greater the number of SF connections with the market and diversity among these connections, the better SF are able to cope with upsets and risk [Ericksen 2008]. On the other hand, a high number of SF-market connections increases the costs associated with placing the product on the market. In the analysed regions, SF with a relatively big number of ways to market their KP include: potatoes (four or five in NT, NS and OE), milk (five in NT and NS), pears (five in OE), apples (four in NS) and lambs (four in NT and AC). Deeper analysis indicated that even perishable KP, which are typically connected with higher transaction costs [Kyomugisha et al. 2018], were not characterized by a smaller number of actors within distribution channels. Another aspect that can be identified is that when SF can choose the commercialization channel to sell their products, as in the case of pears (OE), wine and olive oil (OE and AC), their activity is more protected, and prices are more suitable for their products. In the case of rearing sheep, there is a total dependence on the intermediate buyers associated with large distri-

bution who have total control over prices for lamb meat. Across our studied sub-regions, we discovered that small producer associations could establish a balance of forces and pursue fairer prices for small producers. Niche markets, focused on organic or third-party certified products, can also strengthen the bargaining capacity of SF, help increase their returns and safeguard their livelihoods [Macfadyen et al. 2015].

CONCLUSIONS

The four sub-regions, compared in this study, served to show the differences and similarities across two countries of low rural density: Portugal and Poland. The impact of SF on production flows is different in the surveyed regions depending on the structural characteristics of the region (e.g. soil conditions, accessibility to markets, cultural and historical conditions, etc.) and the selected studied product. KP production flows in surveyed regions in Poland and Portugal also vary according to the type of product (whether sold fresh or processed) and its commercialization channel.

Atypically, in comparison to the other three regions, only one KP in Poland, cereals, was not destined for self-consumption. Among other KP, the higher the level of SF specialization, the lower the share of KP designated for self-consumption. Potatoes in the Polish regions are produced mainly for farm needs, while in OE (Portugal) potato flows are much more complicated (involved more actors) and more market oriented. Fruit in the Polish regions is mostly subject to on-farm processing, although the majority of products are sold to local cooperatives. Fruit in the Portuguese regions was rarely processed by SF. Small lamb producers in the Polish regions represent at least part of direct flows to exporters, while in Portugal, lambs are mainly sold to retailers.

SF in the surveyed regions are active participants of market exchange using different ways of commercialization of their products. In that way, they impact local markets, by delivering diversified products for local consumption. Production flows in the analysed regions are similar in selected aspects: in regions where KP are aimed to be sold outside of the region (export-oriented), regional consumption appears to be reduced. All SF which develop their KP by on-farm processing sell at least part of their processed products. Direct sales of KP at farm stands and farmer markets provide better returns to SF. However, SF associations and cooperatives play a relevant role in securing a market for SF by organizing production (i.e. providing training and input supplies) and guaranteeing a commercialization pathway.

The transformation of KP by small farms seems an important issue and strategy to increase SF income. SF that process their own raw materials often become small food businesses and face different challenges to survive in the regional food system; however, further empirical research is needed to identify the impact of effects SF produce into small food businesses.

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PRZEPŁYWY PRODUKCYJNE DROBNYCH GOSPODARSTW ROLNYCH NA PRZYKŁADZIE REGIONÓW BADAWCZYCH Z POLSKI I PORTUGALII

Słowa kluczowe: drobne gospodarstwa rolne, przepływy produkcyjne, Portugalia, Polska

ABSTRAKT

Podjęto próbę oceny wpływu i znaczenia drobnych gospodarstw rolnych (DGR) w regionalnym obiegu produktów żywnościowych w odniesieniu do kluczowych produktów w wybranych rozdrobnionych regionach rolniczych w Polsce i Portugalii. W badaniach użyto dane zebrane z wykorzystaniem kwestionariuszy ankiet. Ankiety przeprowadzono z właścicielami DGR oraz drobnych przedsiębiorstw branży żywnościowej. Dane pozyskano także podczas spotkań grup fokusowych i warsztatów regionalnych zorganizowanych w latach 2017 i 2018 w podregionach nowotarskim i nowosądeckim w Polsce oraz w podregionach Alentejo Central i Oeste w Portugalii. Analiza pozyskanych danych pozwala stwierdzić, że w badanych regionach w zakresie wybranych produktów zaobserwowano interesujące przepływy produktów wytwarzanych przez DGR. Podkreślić należy rolę przepływów łączących DGR z innymi podmiotami ze sfery przetwórstwa, dystrybucji i konsumpcji. Badania wskazują, że występują zarówno podobieństwa, jak i rozbieżności między regionalnymi przepływami produkcyjnymi w podregionach portugalskim i polskim. Przepływy produkcyjne realizowane przy uczestnictwie DGR są ważną rzeczą, jednak nie do końca jeszcze zbadaną w krajach Unii Europejskiej, dlatego problem ten wymaga dalszych badań empirycznych.

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