

THE CONSERVATION OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE: SELLERS' PERSPECTIVES ANALYSIS FROM SIBIU'S AGRI-FOOD MARKETS

Camelia SAND SAVA, Maria-Mihaela ANTOFIE

University "Lucian Blaga" of Sibiu, Faculty of Agricultural Sciences, Food Engineering and Environment Protection, 7-9 Dr. Ioan Rațiu, 550012, Sibiu, Sibiu county Romania, Emails: camelia.sand@yahoo.com, camelia.sand@ulbsibiu.ro, mihaela.antofie@ulbsibiu.ro

Corresponding author: mihaela.antofie@ulbsibiu.ro.

Abstract

Agri-food markets are among the major pillars relevant for selling agri-food products. However, food industry and hospitality are among the major stakeholders in the food – chain economy. The connectivity between producers, sellers and consumers such as customers of agri-food markets, retailers, food industry and hospitality are relevant for assessing the future implementation of a feasible strategy regarding the rural sustainable development including the conservation of genetic resources for food and agriculture. Sibiu county is awarded for 2019 as a European Region of Gastronomy and therefore a major attention should be paid to city agri-food markets that should be oriented to local products selling. Sellers are among the relevant stakeholders to provide valuable information regarding the food-chain. The scope of this article is to assess the sellers from the largest agri-food market of Sibiu city: "Cibin" market. Based on this analysis, native products from Sibiu are replaced with similar products from different counties or from import to a share up to 5% even during the harvesting season. However, there is optimism in developing the preservation conditions for more perishable agri-food products that may further improve the selling of local products and as a consequence the maintenance of local resources. Thus, by developing preservation conditions for agri-food products will fuel the appropriate conservation measures implementation of plant genetic resources for food and agriculture in a most cost-efficient way.

Key words: sellers, agri-food products, plant genetic resources for food and agriculture, landraces, local breeds, biodiversity conservation

INTRODUCTION

Once Sibiu city, from Romania, was awarded with the title Sibiu European Region of Gastronomy for 2019 it is relevant to evaluate the success of the entire agri-food chain functioning for culinary tourism [16]. The culinary tourism starts in local communities that are providing unique local taste and applies the sustainable development principles for their future [14]. However, the circular economy should function in these areas throughout the involvement of stakeholders interested in the quality of local agri-food products. Among these, customers of agri-food markets from large cities or the hospitality industry, food processing industry are of interest to be attracted to add economic value to the food chain [10]. Such analysis is not very often in Romania, but the current

award raise attention among the local and county stakeholders regarding the success of circular economy in Sibiu city and county [1; 17]. Thus, aside local producers an important subject for analysis are the agri-food markets from cities [8]. In this case, sellers and customers are among the major stakeholders that can be accessed to provide the best information is needed to substantiate the best developing strategies for rural development. The scope of this article is to analyse sellers from three agri-food markets of Sibiu city regarding the success in selling local products. Gaps and needs identification in this regard is essential to connect them with future strategies for rural development in a bottom-up approach for ensuring the conservation and sustainable use of agro-biodiversity in rural areas.

MATERIALS AND METHODS

Survey method. 120 respondents as sellers, randomly selected in the Cibin market of Sibiu have been questioned for some agri-food products such as: vegetables, fruits, cheeses and raw materials for food (i.e. wheat flour).

Only native origin vegetables (i.e. basil, beans, cabbage, dill, garlic, onion, parsley, potato, parsley, tarragon and thyme) and fruits (i.e. apple fruits and plum fruits) were the subject of the survey. These questionnaires were fully accepted by respondents and applied during September 2017 and 2018.

Places of investigations. Agri-food market *Cibin* that is placed at the foot of the old city on the left bank of Cibin river [Fig. 1]. It is open all year around and it is famous for vegetables, fruits and cheeses. Also, there is possible to buy bread, meat and other merchandises [17].

Data analysis Provided data during the survey have been statistically analysed.



Fig. 2 The Cibin market is the oldest and most important agri-food market in Sibiu City.

Source: Modified map after www.google.com/maps.

RESULTS AND DISCUSSIONS

The origin of food products. In “Cibin” market, 43% of sellers, are placing on the market products that are native from Sibiu County, that is less than half of the entire traded merchandise. However, it can be considered that it is a good result for further developing the circular economy. The rest of agri-food products have different origins

either are originating from neighbouring or remote counties either from import. We investigated only potential native agri-food products already mentioned above. Based on the sellers’ statements, they are selling products originating from 11 counties in Sibiu. Moreover, 12% of sellers themselves are originating from the neighbouring Vâlcea County and 26% are from the more remote county of Olt. In this regard, the financial benefits of agri-food markets of Sibiu also attracted sellers from other counties. However, it is relevant to underline that 5% of the merchandise place on the market is imported, even the investigated products should be native in September, the harvesting season (Fig. 2). We consider that such a share represents a threat for local rural economy [20]. This is also due to customers behaviour that is fuelling imported products infusion on the markets. However, this is negatively impacting the rural development activities in the county and region and it is a major threat for maintaining native products such as landraces and local breed in agri-food business. A major role in this will have the customer’s information, awareness and education. Also, it is relevant to support local public policies development that should further support local micro-economy [11]. The diversity of products origin in the Cibin agri-food market supports the idea of the consumer interested in the appearance of commodity (i.e. colour, shape, cleanness), and the price (i.e. lowest price), no matter where they come from. On one hand, the share of less than 50% of the products marketed in Sibiu County shows that, although there exists potential at the county level to support circular economy. However, based on sellers’ opinion it is necessary to support the Sibiu’s producers to integrate them into the commercial market by implementing those financial mechanisms of equitable distribution of benefits [5].

Such a functional mechanism can remove or slow-down the infusions of imported products at least during the harvesting season of native agri-food products. It can be considered that it is a real success the Saturday’s Markets of

“Huet” and “Transilvania” where only local producers from Sibiu county and neighbouring counties are accepted to participate, by raising the awareness of the value of local agri-food products.

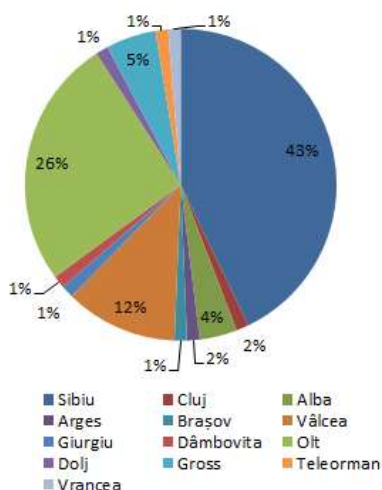


Fig. 2. The place of origin for agri-food products in Cibin market. It can be seen that 43% of the agri-food products are from Sibiu county and 5% are of import origin from the gross market. The rest are of eleven county origins.
 Source: Original data.

The opening of these markets belongs to the vision of the mayor of Sibiu, that started with 2007, when Sibiu was awarded with the title of European Capital of Culture [13]. This can be considered already as a good practice for educating city’s consumers regarding values and quality of local products, local taste and the benefits of supporting local economy [4].

Best-sold local agri-food products in Sibiu.

According to sellers, among all types of products, certain vegetables and fruits are the best-sold and have been the subject for further developing questionnaires for consumers upon a former unpublished study realized in 2016 and 2017 (i.e. potatoes, tomatoes, cabbage, peppers, eggplants, herbs) (Fig. 3). Usually, unperishable vegetables and fruits are the best sold. One inconvenience is the lack of cooling storage places in case of perishable vegetables and fruits, that even they are produced in the region however, they cannot compete with those that are imported.

Sellers opinion regarding the future of original products from Sibiu county. The long-standing experience of sellers is essential

to make considerations about the real projection and development of any market strategy in this area. That is why we consider the answers of sellers in “Cibin” agri-food market to be relevant [6].



Fig. 3. The best agri-food products sold in Cibin market. Tomatoes, cabbage, potatoes, pepper and cucumbers are among the best sold vegetables.
 Source: Image generated at: <https://www.jasondavies.com/wordcloud/>.
 Original data.

A share of 49% of respondents believe that it would be possible to increase trading which would support further the implementation of the Programme supporting the award European Region of Gastronomy for 2019 (Fig. 4).

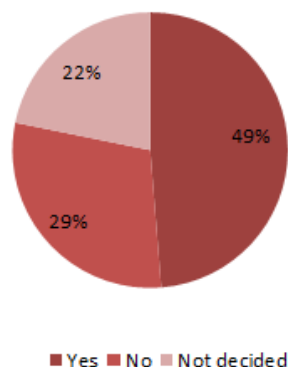


Fig. 4. 49% of sellers considered that there is still a potential for increasing sales into the Cibin market.
 Source: Original data.

They are taking into consideration their personal experience related to improvements’ history of agri-food markets during the past

ten years. However, they are not very optimistic due to the imports and the lack of storage-houses for vegetables, mainly highly perishable in the region. Based on their opinion the life-time of vegetables from Sibiu county or neighbouring counties is shorter because of the lack of interest of developers to invest in agri-food business of local origin, a situation similar with others reported already [12]. Among the major stakeholders have been mentioned county's and local authorities that have no interest or financial support to develop equitable incentive measures that might attract investors in this business.

All respondents claimed that storage conditions for vegetables should be improved and especially selling conditions during summer and winter seasons. They complained about the lack of storage conditions during the nights and weekends as well as the lack of protection against the canicular or frosty and windy days inside the agri-food markets. Based on their opinion also customers are not visiting the markets during these days.



Fig. 5. The most frequently mentioned products not very well sold in the Cibin market during the season are cauliflower and potatoes from Sibiu county. Image from: <https://www.jasondavies.com/wordcloud/>. Source: Original data.

The hardest agri-food products for selling.

Consumers' education on agri-food products can also be analysed from the perspective of sellers by linking consumers' data to agri-food product categories [19]. In other words, according to the sellers, more perishable products are much economic loss are. These products require particular preservation conditions, and this is the reason why

customers are avoiding buying them even if they are part of the Bio category. Thus, cauliflower is preferred to be bought from large retailers (i.e. import for different countries) to the detriment of agri-food markets where a suitable climate conditions cannot be provided to prevent browning. This situation was already signalled by other authors in other countries [7]. In addition, responses become relevant if they associate with the origin of the sellers (e.g. the leek is marketed by southern producers from Vâlcea, Olt) the general appearance of vegetables and fruits (i.e. cauliflower and quince) as well as the competition (i.e. potatoes sold from other counties or even from other countries such as Turkey during early spring time). Leeks are not very well sold into the agri-food market according to the sellers and wilting is the major threat for sellers (Fig. 5).

Cheese selling for all year around. To ensure the sustainable selling of agri-food products during one year duration it is relevant to consider the potential success of primary food products on the market [3]. Such an approach will further support the continuous use of traditional genetic resources inside agro-ecosystems as well as will maintain the traditional knowledge related to the genetic resources for use, processing and selling. In Sibiu it was recognized the brand "Sibiu's cheese" due to the traditional knowledge related to the seeps breed as well as cheese production under specific conditions [1]. Therefore, cheese can be considered as a valuable food resource regarding its use and selling all over the year.

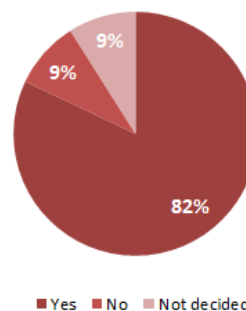


Fig. 6. Sellers opinion on the potential selling of cheeses all year. 82% of the sellers considered that it is possible to develop the market for selling cheeses all year around. Source: Original data.

On the other hand, sellers may have a positive impact in changing consumer perceptions and may provide a fairly realistic picture of their philosophy generally for trade.

Thus, cheeses could be marketed constantly throughout the year at higher levels in the opinion of 82% of cheese sellers (Fig. 6). However, there are gaps according to the sellers that are originating from the need to improve selling conditions into the market' places.

The vision of sellers related to the future of agri-food market in Sibiu. Perhaps the most difficult question is about the opinion of sellers regarding the future of agri-food market in Sibiu city. Almost all of them have a long-standing family experience in marketing agricultural products. Despite all difficulties (i.e. the lack of storage-houses, the lack of shelters during the canicular, heavy raining or frosty days) over half of the respondents were optimistic (Fig. 7). They took into account the continuous improvement of the conditions in "Cibin" agri-food market as well as the development of "Tranilvania" and "Huet" market's places. Also, the recent branding of local food staff contributed to the increase of their visibility as well as their own income.

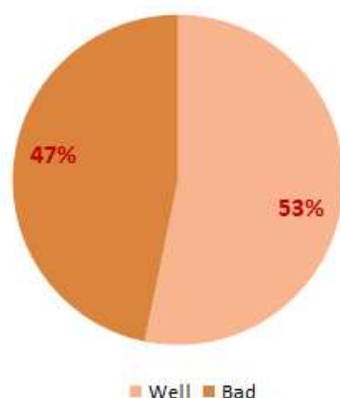


Fig. 7. More than 53% of the sellers considered the potential increase for cheeses sales into the market.
Source: Original data.

Data regarding sellers. 58% of the sellers are content with their job and 55% are optimistic for the general increasing of agri-food products selling in "Cibin" market. 54% of respondents were women. Regarding their age: 30% of respondents were between 30 and

45 years old and 34% between 46-55 years old. Regarding their social status, 70% of respondents were married, 13% divorced, 10% unmarried % and 7% widows.

CONCLUSIONS

Agri-food markets are among the major food-supply in Sibiu city in the same manner like in other cases [15]. The sellers are mostly selling unperishable fruits and vegetables, a similar situation with the Netherlands and United Kingdoms [18]. On contrary perishable fruits and vegetables are of import origin due to the lack of refrigeration conditions and additional high costs [2]. Thus, under these circumstances, local agri-food products of Sibiu county origin are replaced by those of import. The selling conditions are claimed that need to be improved if local products should be supported for their entering the city agri-food markets. Based on the above conclusions we consider that by supporting the selling conditions in agri-food markets, local products will fully enter the food chain for Sibiu county and may further support local producers from rural areas in a similar way like in other cases [9]. Only closing the loop in the circular economy of rural areas will be possible to think of a real cost-efficient strategy for further supporting the conservation and sustainable use of genetic resources for food and agriculture and the ensuring of food security for the future [1].

ACKNOWLEDGMENTS

This study was supported by the contracts nr. 71065/04.09.2017 and 48124/19.06.2018 of the Research Centre for Agricultural Sciences and Environmental Protection of the University Lucian Blaga from Sibiu. Surveying activities were realized with the support of students coordinated by Lecturer Moise Cristina.

REFERENCES

[1]Antofie, M.M., 2011, The Red List of Crop Varieties for Romania-Lista Roşie a varietăţilor

plantelor de cultură din România. Publishing House Lucian Blaga University from Sibiu.

[2]Aste, N., Del Pero, C., Leonforte, F., 2017, Active refrigeration technologies for food preservation in humanitarian context—A review. *Sustainable Energy Technologies and Assessments*, 22: 150-160.

[3]Brunori, G., Galli, F., Barjolle, D., Van Broekhuizen, R., Colombo, L., Giampietro, M., De Roest, K., 2016, Are local food chains more sustainable than global food chains? Considerations for assessment. *Sustainability*, 8 (5): 449-458.

[4]Chambers, S., Lobb, A., Butler, L., Harvey, K., Traill, W.B., 2007, Local, national and imported foods: a qualitative study. *Appetite*, 49(1): 208-213.

[5]Fieldhouse, P., 1996, Community shared agriculture. *Agriculture and Human Values*, 13(3): 43-47.

[6]Fischer, C., 2013, Trust and communication in European agri-food chains. *Supply Chain Management: An International Journal*, 18(2): 208-218.

[7]Gautam, D.M., Neupane, R., Tripathi, K.M., Acedo, A.L., Easdown, W., Hughes, J.A., Keatinge, J.D.H., 2015, Cauliflower handling trials integrating best practice and developed technologies to reduce postharvest losses in Nepal. In III Southeast Asia Symposium on Quality Management in Postharvest Systems 1179: 207-212.

[8]Hubeau, M., Vanderplanken, K., Vandermoere, F., Rogge, E., Van Huylenbroeck, G., Marchand, F., 2019, Sharing is caring: the role of culture in the transformative capacity and continuation of agri-food networks. *Environmental Innovation and Societal Transitions*: 1-13 (on line).

[9]Jackson, P., Evans, D.M., Truninger, M., Meah, A., Baptista, J.A., 2019, The multiple ontologies of freshness in the UK and Portuguese agri-food sectors. *Transactions of the Institute of British Geographers*, 44(1): 79-93.

[10]Liu, S.Y., Yen, C.Y., Tsai, K.N., Lo, W.S., 2017, A conceptual framework for agri-food tourism as an eco-innovation strategy in small farms. *Sustainability*, 9(10): 1683 (doi:10.3390/su9101683).

[11]Ponikvar, N., Tajnikar, M., 2012, The Impact of Foreign Trade on Markup Size: Evidence from a Dynamic Panel Model of Slovenian Manufacturing Firms. *Eastern European Economics*, 50(1): 46-64.

[12]Porter, M.E., 2000, Location, competition, and economic development: Local clusters in a global economy. *Economic development quarterly*, 14(1): 15-34.

[13]Richards, G., Rotariu, I., 2015, Developing the eventful city in Sibiu, Romania. *International Journal of Tourism Cities*, 1(2): 89-102.

[14]Rinaldi, C., 2017, Food and gastronomy for sustainable place development: A multidisciplinary analysis of different theoretical approaches. *Sustainability*, 9(10): 1748 (doi:10.3390/su9101748).

[15]Sharp, E.L., Schindler, E., Lewis, N., Friesen, W., 2016, Food fights: irritating for social change among

Auckland's alternative food initiatives. *Kōtuitui: New Zealand Journal of Social Sciences Online*, 11(2): 133-145.

[16]Sidali, K.L., Spiller, A., Schulze, B. (Eds.), 2011, Food, agri-culture and tourism: Linking local gastronomy and rural tourism: Interdisciplinary perspectives. Springer Science & Business Media.

[17]Stanciu, M.C., 2018, Analysis of the behavior and motivation of consumers towards Short Food Supply Chains. *Scientific Papers Series-Management, Economic Engineering in Agriculture and Rural Development*, 18(4): 73-77.

[18]Van den Heuvel, D., 2016, Food, markets and people: Selling perishables in urban markets in pre-industrial Holland and England. In *Food Hawkers*. pp. 102-124. Routledge.

[19]Van Der Vorst, J.G., Tromp, S.O., Zee, D.J.V.D., 2009, Simulation modelling for food supply chain redesign; integrated decision making on product quality, sustainability and logistics. *International Journal of Production Research*, 47(23): 6611-6631.

[20]Williamson, P.J., 1990, Domestic pricing under import threat. *Applied Economics*, 22(2): 221-235.