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SOCIAL NETWORKS – A TOOL FOR COOPERATION OF BULGARIAN AGRICULTURAL PRODUCERS

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Abstract
Bulgarian agriculture has gone through many transformations in the last two decades. The concentration of production and the difficult access of smaller farms to forms of public support led to their unequal competitive position. Some owners of such small farms began to seek support and advice from other producers, exchange experiences and organize joint actions. Social networks are also used for these new forms of cooperation, as a popular tool for building groups and communication between their members.
The purpose of the present study is to evaluate the models for the application of social networks as a tool for the cooperation of agricultural producers in Bulgaria. In order to achieve this goal, it is necessary to solve the following tasks: to assess the need for producers to cooperate; to analyze the implemented traditional forms of cooperation in the country, revealing their deficiencies; to consider specific examples of the application of social networks, as a tool for cooperation of producers from the agriculture sector in Bulgaria.
Social networks, or social media platforms have been a focus of analysis since their launch and in later years some meta studies and literature reviews have attempted to organize and structure most of the previously done research on the topic (Ali, et al. 2023; Ibrahim, 2022). In these studies, the five main topics of discussion have been: social media, social collaboration, social marketing, social media and crowdfunding, and social media and crowdsourcing. Social media as a tool for crowdsourcing can be used by different stakeholders to share crucial information (Clark, et al., 2023) and in those cases a cooperation among social actors can be built.
The negative effects of social media on traditional network-building have also been explored by some authors, that put forward concerns about the differentiation of goals between social media platforms and their userbase, that can lead to degradation of social cohesion (González-Bailón, et al., 2023). Although being critical, those researchers can't deny that social media platforms are granting opportunities that would be absent without them. Furthermore, if academics have access to social media analytics tools a more in-depth analysis of information sharing and social impact can be developed (Horng, et al., 2023). The lack of access to such tools for the current research has led to the selection of included observation for the analysis of the application of social networks as a tool for the cooperation of agricultural producers in Bulgaria. Social media interactions remain an understudied topic in the country and its relevance as a cooperation building tool remains to be proven.
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Introduction

The agricultural sector in Bulgaria has adapted to the new economic and social conditions after the accession of the country to the European union. This adaptation has several shortcomings underlined by Bulgarian researchers, such as the production focused of materials with low value (Nikolova, 2013), the levels of sustainability of the sector (Bachev, et al., 2019), its financial stability (Stoyancheva, et al., 2023) and ecological viability (Georgieva, et al., 2022). A number of these issues can be solved by cooperation among producers that can promote the introduction of a longer value chain leading to better economic results for all participants and the sector as a whole. Bulgarian agriculture has a long history of cooperative actions (Marinova, et al., 2020), but after the transformation of the country's economy from planned to market state the role of cooperatives has rapidly decreased, as well as the participation in them. In the current environment the introduction of new forms of cooperation, that have no direct relations to the soured history of agricultural cooperatives in Bulgaria have the potential to increase the added value for participating producers.

Methodology

In order to analyze the participation of producers in these new models for cooperative actions this research is focused on one of them – cooperation through social networks, and specifically the cooperation of apicultural producers in a group of their own making, facilitated by the Facebook social network. This group has 18 093 participants as of 24th of September 2023. This research is based on included observation of communications for period of 30 days, during which 195 post ware made by group participants, divided in to six categories: sharing of information (and discussing the information being shared); seeking information by asking direct questions to other participants; offering inventory, chemicals or apicultural colonies for sale; seeking to purchase inventory, chemicals or apicultural colonies; offering finished products for sale and seeking to purchase finished products. Cooperation of economic agents through social networks is a growing field of study and discussion among researchers worldwide (Abatayo, et al., 2018; Buskens, et al., 2000, Grozdeva, 2012, Danchev 2010; Hanaki et al., 2007; Melamed, et al., 2022). The framework of each study is specific to the topic and level of development of social networks during the period. The rapid development of digital technologies and dynamics of social network's participation can have an impact on the results and effect of studies.

This research is focused on the period between 23rd of August and 23rd of September 2023, selected for its importance for the apicultural sector in Bulgaria regarding the activities characteristic for it. During this period most of the production is winding down, the natural honey produced is already collected and the preparation for winter hibernation has not yet started. The production results are assessed and decisions for the next production cycle are also made by the owners.

Results

Bulgarian apiculture has been developing since the accession of the country to the European union, under the improved social support framework and local production traditions. The number of apicultural colonies has continuously increased as shown in Table 1, reaching a peak in 2019 with over 867 thousand colonies in the country. The production of natural honey has thus increased, as well as its efficiency. This is a result from its's concentration and specialization.

Table 1. Natural honey production in Bulgaria

	2016	2017	2018	2019	2020	2021	2022
Apiculture colonies	754105	765772	783348	867561	863283	837955	823250
Natural honey produced (t)	10218	11807	10338	11518	9066	11638	11944

Source: Agrostatistics of the Ministry of Agriculture and food

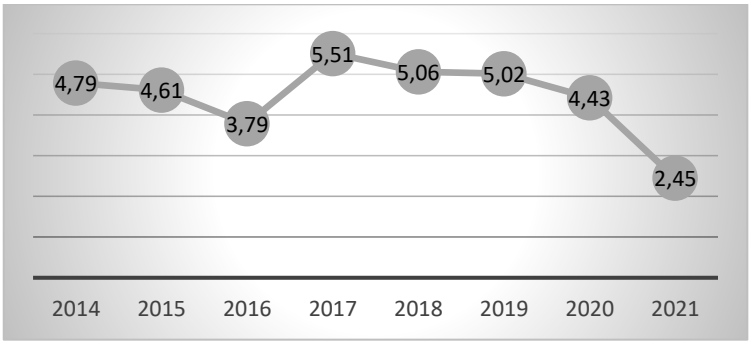
This process has led to decrease in efficiency at first, with some productions growing too fast and being unable to tend to all colonies, but during the last CAP planning period (after 2017) the efficiency has increased, and the process of concentration increased in speed. As shown on Table 2 by 2022 the smallest holdings have dropped down to under 1/3 of their numbers in 2016, while the largest holdings have doubled during the same period.

Bulgarian produced natural honey is export oriented, and in some years (2014, 2017, 2018 etc.) exports exceed production. The increase in imports of natural honey has led to the decrease of the levels of competitiveness of Bulgarian production, as shown on Graph 1. The competitiveness calculated by the Balassa index, corrected to consider imports as well, is still positive. Bulgarian natural honey is still positioned well on international markets, with a higher-than-average sales price. This trend can change if the levels of imports continue to increase, and the level of competitiveness continues to decline. Bulgarian producers have started to feel the pressure of these imports, as they fear that products with lower quality from other countries are combined with local higher quality ones, which can lead to the degradation of Bulgarian natural honey image on international markets.

Table 2. Number of apicultural farms in Bulgaria by size

	2016	2017	2018	2019	2020	2021	2022
1 to 9	3858	2804	2510	2440	1968	1188	1238
10 to 49	6196	5239	4584	5678	3689	3945	3455
50 to 149	4172	4188	3526	4093	4273	3819	3383
above 150	1080	1200	1640	1560	1696	1849	2148
Overall	15306	13431	12260	13771	11626	10801	10224

Source: Agrostatistics of the Ministry of Agriculture and food



Graph 1. Competitiveness of Bulgarian natural honey

The concentration of production has led to an increasing amount of natural honey being produced by a significantly lower number of holdings. The information requirements of these larger, modernized producers have increased, and they are seeking new data sources, different from the number of apicultural associations that failed to consolidate their activities. These changes require an analysis of these new informational virtual venues attended by the new generation of producers. It is in this context that the current research is focusing on one such venue – the apicultural Facebook group named „Apiculture“ with 18 093 participants, a number higher than the number of producers in the country.

The collected data on member participation in the form of 195 posts is separated into six main groups, as shown in Table 3. The largest of the groups is information sharing. In this group of publications participants are sharing knowledge, providing relevant news, sharing experiences, information on calls for action and policy changes. For each of the groups an average of active and passive participation is calculated. Active participation is based on replies from community members, adding to the discussion or providing rebuttals. Passive participation represents the reaction available to group members, which provides less information and does not add much to the discussion. In the largest group of posts the ratio of active to passive

participation is almost 1 to 10. This low average number of just over 53 passive participants and 5 active participants in information acquisition among over 18 thousand group members proves that they are not stimulated by simple data provision.

Table 3. Participation in the Bulgarian „Apiculture" Facebook group form 23rd of August to 23rd of September 2023

	Information sharing	Inventory purchase	Inventory sales	Product purchase	Questions	Sales	Overall
Cases	72	10	54	2	33	24	195
Avg. active participation	5,4	7,6	1,8	1,5	24,6	8,7	8,1
Avg. passive participation	53,3	8,4	9,7	10	27,4	28,0	31,0

Source: Own calculations based on data collected by included observation of Bulgarian „Apiculture" Facebook group form 23rd of August to 23rd of September 2023

The other main form of information acquisition is through posts raising questions to the community. In these cases, the active participation is a lot higher than the previous group. Raising a specific question has proven to have significantly better results with information being shared by almost five times more members of the community. These posts create a space for discussion and information sharing among producers from all parts of the country and have proven their results by the significantly higher average activity. The cooperation build by such active participation in group communication can have positive results for the development of the sector, by increasing the participants knowledge base and improve their abilities as other authors have also discussed (Abatayo, et al., 2018).

The posts by group members that seek to purchase inventory, has led to a higher level of active participation than the posts offering inventory, but most active suppliers keep creating sales posts regularly (usually on every other week, to not irritate and to comply with the group's ruleset and norms).

The posts seeking to purchase finished products during this very active period are very low – just two of such nature were created. What was even more interesting was the low active participation of producers on such posts. During the same period the posts offering finished products for sale numbered 24 with significantly higher levels of participation. The gathered data shows that there was a high amount of products seeking a market, but producers did not want to openly communicate with buyers and most likely chose to do so privately. These decisions are an important indicator for the analysis of the readiness for cooperation among producers. There

is a significant deficit of trust among producers regarding sales of finished products. Members of the group choose to offer their products on the market separately, without seeking any form of cooperation. They prefer to negotiate prices in private and not share information regarding them. Most posts that offer to sell finished products have a stated price per kilogram, in ranges that are socially approved by the group (10 – 12 lv. for average quality during the studied period). The sales post with most active participation (63 replies) has an offering price of half of the socially accepted average, just 5 lv. per kilogram. The offering producer was openly and actively ridiculed for creating such a precedent for the group. The other post with a high number of active participation (53 replies) and the most passive participation (115 reactions) was a sales offer turned in to a price discussion that took place in the beginning of the research period when the products ware starting to go on sale. This case can be interpreted by cooperation among producers to settle an average sales price for the product.

Another edge case of importance is an information providing post of an unhappy customer sharing their experience of the purchase of products from one of the members of the group. This was the information post with the highest active participation (55 replies). The community was divided in their participation, some raising questions about high levels of consumer quality demands, and some focusing on proving that this bad example does not represent the group. In this case the lack of participants with high amount of social capital, that can represent or provide direction for the group was evident. The high number of participants in this Facebook group and the low average participation (active participation in the 30-day period on average was 8,1 replies per post) is an indication of the low level of engagement of actors. The results of the analysis of these cases in correlation with the low levels of social capital of participants can challenge the creation of cooperative action among producers in this digital space. This result of the analysis is further supported be the last two edge cases – the two posts with most passive participation (271 and 232 reactions) ware providing well wishes for the producers and evidence of a colony being captured by one of the group's members, thus providing little to no useful information.

Conclusions

The accession of Bulgaria to the European Union and the development of the agricultural sector under the Common agricultural policy led to significant changes. Local producers are facing competitive pressure not just from European producers, but also from larger actors on international markets. Raising the level of cooperation among local farmers can help relieve some of the pressure, by creating a supportive structure and longer value chains. In these cooperative efforts new digital tools can play a significant role, but only if the levels of social capital can be raised.

This study focused on just one sub sector – apiculture, and thus cannot provide a decisive framework for the development of cooperative actions threw social media networks among Bulgarian agricultural producers as a whole, but still some useful conclusion can be drawn. The highest incentive for participation in information sharing and discussion among group participants was the determining of a common balanced price level. The lowest participation was evident with inventory offers by suppliers. This allows for the conclusion that cooperative action can be reached through collective price negotiation action, but such is impossible at scale at this time due to lack of trust among group members. Efforts should be made to raise the levels of social capital among agricultural producers, that will allow network building, and can lead to cooperative actions.

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