

Entrepreneurship in the Beekeeping Sector - Between Entrepreneurs' Motivation and Consumer Perception

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Abstract

This paper examines the interplay between consumer preferences and entrepreneurial strategies in the Romanian beekeeping sector, highlighting sustainability, product authenticity, and market adaptability. The research employs a mixed-methods design, combining quantitative and qualitative approaches. The quantitative survey, conducted on 210 consumers, was analyzed using Chi-square tests, Spearman's correlation coefficient, multiple linear regression, and logistic regression. The qualitative component consisted of interviews with seven beekeepers, analyzed through thematic analysis using NVivo software. The findings show that age, gender, trust in local producers, and the perceived importance of Romanian origin significantly influence the frequency of honey consumption. Although not all hypotheses were statistically supported, the observed behavioral patterns emphasize the relevance of product diversification, traceability, and direct producer-consumer relationships in shaping loyalty. The qualitative results highlight entrepreneurs' motivations, ranging from tradition to financial opportunity, and their continuous adaptation to consumer demand through innovations in products, packaging and distribution. Overall, the results demonstrate that the competitiveness of Romanian beekeeping depends on integrating consumer-driven insights into entrepreneurial decision-making, with sustainability and authenticity as key drivers of long-term development.

Keywords: Beekeeping; sustainable entrepreneurship; consumer preferences; honey market; beekeeping products; rural development

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1. Introduction

The specialized literature increasingly addresses beekeeping from the perspective of sustainable entrepreneurship. It is seen not only as a traditional agricultural activity, but also as an opportunity for economic development in rural areas undergoing transition. Due to its ability

to generate economic value and ecological benefits, beekeeping provides a favorable framework for local initiatives that positively impact the community (Pocol et al., 2021).

In a context marked by climate change and productivity pressures, modern beekeeping increasingly involves integrating technology into production processes. Beekeeping entrepreneurs use digital systems, sensors, and online distribution channels to adapt to market demands and improve decision-making processes. (Gil-Lebrero et al., 2017; Zacepins et al., 2020).

Studies in the specialized literature on consumer behavior highlight that preferences for natural products perceived as healthy and trust in local producers significantly influence food choices (Verain et al., 2015; Feldmann & Hamm, 2015). These findings are also relevant to the market for beekeeping products, where consumers are increasingly turning to local sources and products with a perceived sense of authenticity.

Consumer preferences for beekeeping products are primarily influenced by perceptions of health benefits, taste, and local origin. These elements create a sense of trust and loyalty toward the producer (Ignjatijević et al., 2019). Honey consumers increasingly prefer products that are traceable and have clear labeling, including through technologies such as QR codes, which enhance consumer confidence (Mascarello et al., 2024). These expectations align with sustainable, consumer-oriented business models, which emphasize adaptability and value creation in business models (Al Daraai & Madbouly, 2024).

In this context, the article takes an applied approach to analyze the relationship between beekeeping entrepreneurs and consumers of beekeeping products in Romania. By combining qualitative methods, such as interviews with beekeepers, with quantitative methods, such as surveys of consumers, a comprehensive understanding of how market demand influences entrepreneurial strategies and vice versa is achieved. This mixed approach connects theoretical dimensions with field realities and offers concrete ways to strengthen the beekeeping product market and support local producers.

2. Theoretical foundations of entrepreneurship in beekeeping

According to Hisrich, Peters and Shepherd (2017, p. 61), entrepreneurship involves identifying opportunities, mobilizing resources, and taking risks to create value, including in modern beekeeping initiatives.

These initiatives can be analyzed through the lens of creative destruction, a concept formulated by Schumpeter (2013, p. 104) that describes how entrepreneurial innovations gradually replace traditional structures in a dynamic economy.

Beekeeping entrepreneurship is a unique type of economic initiative that lies at the intersection of agriculture, the food industry, and the sustainable economy.

Bessant and Tidd (2015) argue that the entrepreneurial process is influenced by the context in which it occurs. When applied to beekeeping, for example, this process is shaped by characteristics such as seasonality, the unique features of the rural environment, and the degree of access to markets and information.

Modern beekeeping is more than just producing honey, it's a diverse and sustainable economic activity. In addition to honey, beekeepers can capitalize on a variety of secondary products,

including pollen, wax, propolis, and venom. These products increase income and open new market niches (Popescu et al., 2024).

2.1. Defining entrepreneurship and its applicability in beekeeping

Peter Drucker (1985) says that entrepreneurship is not just for those considered to be an elite, but can be learned if the resources are available. This statement is extremely valuable for rural areas, where resources are limited but can be compensated for by community support.

Furthermore, in agriculture, entrepreneurship takes on a specific dimension, as it is conditioned by seasonality, climatic uncertainties, and dependence on natural resources (Boix-Fayos & de Vente, 2023). Compared to traditional industries, where planning is more predictable, agriculture requires a greater capacity to respond quickly to external changes.

Entrepreneurship, when applied to the beekeeping sector, entails managing efficiently at a biological level-which relates to the bee colonies-and understanding the market's needs in creating an adapted offer. It is a type of entrepreneurship that increasingly depends on digitalization and the need for sustainability (Danieli et al., 2024).

Therefore, there is an interdependent relationship between entrepreneurship and consumer behavior, one that influences both the way beekeeping businesses are organized and their growth potential.

2.2. Transformations in beekeeping: from traditional practice to modern business

Beekeeping can represent a viable source of income for rural households due to its relatively low capital requirements and the possibility of direct market sales. However, the transition towards a modern beekeeping model is hindered by systemic vulnerabilities such as the insufficient training of beekeepers and difficulties in disease control (Jacques et al., 2017), which lead to massive losses and affect business stability.

An orientation toward sustainability is a defining element of the transition to the modern business model. Indeed, Panța (2017) mentions that the objective of sustainable beekeeping entrepreneurship necessarily consists of considering economic, ecological, and social ends. By offering ecological practices and product traceability, entrepreneurs can respond to consumer demands in an informed manner.

Digital technologies are bringing significant changes to hive management. Sensors and remote monitoring applications contribute to reducing losses and increasing production efficiency (Gil-Lebrero et al., 2016). Although access to such innovations is sometimes limited, their potential is considerable.

In such a landscape, adaptability becomes the key factor. Christodoulou et al. (2024) highlight the importance of adapting business strategies to evolving consumer preferences, which may include aspects such as product assortment, packaging, or purchasing channels.

Studies have demonstrated that beekeeping now represents not only an economic activity but also benefits biodiversity, local identity, and social cohesion in an interplay of economic, ecological, and cultural dimensions (Etxegarai-Legarreta & Sanchez-Famoso, 2022).

The mechanism of supply and demand directly influences the price, quality, and structure of bee products, and entrepreneurs in the field must adapt based on a clear understanding of these dynamics (Bodescu, 2007, p. 78).

Modern beekeeping is changing under the impact of sustainability, digitalization, and market demands, shaping a rural entrepreneur who is involved, innovative and connected to local realities.

2.3. Theoretical connections between entrepreneurship and consumer behavior

In modern beekeeping, entrepreneurial success depends to a large extent on the ability of producers to understand and respond to consumer preferences. The specialist literature highlights that consumption motivations, such as health concerns and product-related attributes, influence honey consumption behavior (Kowalczyk et al., 2023; Yüzbaşıoğlu, 2023). These factors may also affect purchasing patterns and the orientation towards local products.

Studies conducted in Central Europe by Lymperi and Fragkaki (2020) and Šedík et al. (2023) highlight the importance of product origin and consumer trust in shaping purchasing behavior, particularly in relation to direct interactions with local producers. These factors are associated with preferences for locally sourced products and trust-based purchasing patterns. In addition, Arghiroiu and Beciu (2023) emphasize the role of product quality and market positioning in supporting the competitiveness of the Romanian beekeeping sector.

It is critical for all beekeeping entrepreneurs to adapt to new trends that are developing as well as to continue developing and diversifying their products in order to find success in their local markets. As noted by Chekol et al. (2022), consumer-related factors such as trust, product quality, and availability significantly influence purchasing behavior. In this context, adapting to evolving consumer preferences and diversifying product offerings can contribute to maintaining competitiveness and long-term sustainability in local markets.

Additionally, a higher frequency of consuming a variety of bee products, as well as more frequent label reading, may indicate a more informed and selective consumer profile (Mascarello et al., 2024). Recent research findings support the importance of quality-related attributes in shaping consumer behavior. Factors such as product quality, origin, and market positioning can contribute to consumer trust and the development of competitive advantages within the beekeeping sector (Prodanović et al., 2024) and in broader agri-food and digital market contexts (Boldureanu et al., 2025).

Thus, an in-depth understanding of the relationship between consumer motivations and entrepreneurial strategies in beekeeping provides the foundation for formulating research hypotheses and allows for an explanation of the current dynamics of the beekeeping products market.

3. Research methodology

This applied research aims to investigate the realities of beekeeping entrepreneurship in Romania through a mixed qualitative and quantitative approach. The chosen method allows for capturing both the internal dynamics of beekeeping businesses, through interviews with entrepreneurs, and the ways in which these businesses respond to consumer behavior and perceptions, through the analysis of survey questionnaires. The methodological structure of the research is detailed below.

3.1. Purpose, objectives, and research hypotheses

The purpose of this research is to analyze the relationship between consumer behavior and the dynamics of beekeeping entrepreneurship in Romania, with a focus on identifying directions for local economic development and strengthening trust in domestic producers.

The research objectives are as follows:

1. **To investigate the motivations of beekeeping entrepreneurs;**
2. **To evaluate consumer perceptions regarding beekeeping products;**
3. **To analyze the factors that influence the purchase of beekeeping products;**
4. **To determine the relationship between consumer demand and the strategies of beekeeping entrepreneurs.**

The formulation of the research hypotheses is based on conclusions drawn from recent specialized literature on consumer behavior regarding beekeeping products. Previous studies have shown that demographic and socio-economic factors such as age, gender, income, and education significantly influence honey consumption behavior. In addition, factors such as perceived product quality, health benefits, trust in producers, and purchasing channels play an important role in shaping consumer preferences (Kowalczyk et al., 2023; Yüzbaşıoğlu, 2023; Chekol et al., 2022; Šedík et al., 2023; Lymperi & Fragkaki, 2020; Mascarello et al., 2024).

Based on these findings, the following hypotheses are proposed:

H1: There is a statistically significant association between consumers' age and the frequency of beekeeping product consumption.

H2: The perception of honey as a natural and healthy product influences the preference for direct purchases from beekeepers.

H3: The frequency of beekeeping product consumption is significantly influenced by age, gender, the perceived importance of local origin, trust in local beekeepers, and the preference for direct purchases from beekeepers.

H4: Consumers who read product labels and consume a wider variety of beekeeping products are more likely to recommend a local producer.

3.2. Research design and methods used

The study is based on an exploratory-descriptive research design. The quantitative dimension consisted of administering a questionnaire to consumers of beekeeping products, while the qualitative dimension was carried out through semi-structured interviews with entrepreneurial beekeepers from Romania.

3.3. Data collection instruments and techniques

The quantitative survey was conducted online, using the "snowball sampling" method for questionnaire distribution. The instrument contains 17 questions organized into four thematic sections: consumption behavior, selection criteria, perceptions of local products, and socio-demographic data. The complete questionnaire used for data collection is presented in Appendix 2.

Qualitative data collection was carried out through interviews conducted both by phone and face-to-face, depending on respondents' availability. Seven beekeepers from different counties of the country were interviewed, with experience ranging from 4 to 43 years, operating under various organizational forms (Sole Proprietorship, Limited Liability Company - LLC, Family-Owned Business, Agricultural producers). In the specialized literature, qualitative research is considered relevant if the number of interviewees ranges between 6 and 12 persons (Guest et

al., 2006; Onwuegbuzie & Collins, 2007; Ando et al., 2014).

Detailed information regarding the participants' location, age, legal form, experience, number of hives, and interview type is presented in *Table 9 (Appendix 4)*. The geographical distribution of the seven interviewed beekeepers is presented in *Figure 1*.

Figure 1. Geographical distribution of the interviewed beekeepers



Source: Own processing

As *Figure 1* shows, the qualitative sample includes participants from counties located across several regions of Romania, rather than being concentrated in a single geographical area.

3.4. Data processing

The collected data were analyzed using *IBM SPSS Statistics* (version 22), applying statistical methods appropriate to the research objectives and hypotheses. For hypothesis testing, the following techniques were used: the Chi-square test for associations between categorical variables, Spearman's rank coefficient for ordinal correlations, binary logistic regression for identifying factors influencing a dichotomous outcome, and multiple linear regression for estimating relationships between several predictors and a continuous dependent variable.

The dependent variable was measured on a five-point Likert scale and was treated as a quasi-continuous variable, a common practice in social sciences when the scale includes at least five ordered categories (Field, 2013). All assumptions of linear regression were assessed (linearity, homoscedasticity, independence of errors, and normality of residuals), and no major violations were detected.

The qualitative component was analyzed using a thematic approach. All interviews with beekeeping entrepreneurs were fully transcribed, coded, and structured into relevant themes (as detailed in Appendix 3 - Interview Guide). The coding process followed NVivo's analytical framework. Transcripts were organized and examined using NVivo-assisted features such as node creation and thematic grouping, which facilitated the systematic organization of recurring ideas, relationships, and patterns across respondents. NVivo served primarily as a support tool, ensuring consistency and transparency in the coding process and in the development of themes.

4. Results and interpretations of the quantitative research

The socio-demographic characteristics of the respondents are presented in *Table 8 (Appendix I)*. The majority were women (70.5%), while men accounted for 28.1%. In terms of age, 50.2% of participants were under 25 years old, 29.7% were between 25-35 years old, and only 7.2% were over 50 years old. Regarding place of residence, 56.2% live in urban areas and 43.8% in rural areas. From an educational perspective, most respondents hold a bachelor's degree (43.5%) or a master's degree (29.2%), while 25.4% have completed secondary education and 1.9% hold a doctoral degree.

Based on the data collected and processed in SPSS, this section analyzes the testing of the formulated hypotheses (H1-H4) by applying the appropriate statistical methods.

4.1. Testing Hypothesis H1

Hypothesis H1: There is a statistically significant association between consumers' age and the frequency of beekeeping product consumption.

The frequency analysis shows that young people under 25 and individuals over 50 tend to consume beekeeping products more frequently (daily or weekly), while respondents aged between 25-50 report less frequent consumption.

Table 1. Chi-Square Test results for the association between age and frequency of beekeeping product consumption

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	41.879 ^a	12	.000
Likelihood Ratio	44.052	12	.000
Linear-by-Linear Association	27.098	1	.000
N of Valid Cases	210		

Source: Own processing in SPSS, based on questionnaire data (N=210).

The Chi-square test, as presented in *Table 1*, indicates a statistically significant difference between age groups regarding the frequency of beekeeping product consumption ($\chi^2(12)=41.879$, $p<0.001$). This result confirms that age significantly influences consumption behavior.

Table 2. Spearman's correlation between age and frequency of beekeeping product consumption

		Correlations	Consumption frequency	Age
Spearman's rho	Consumption frequency	Correlation Coefficient	1.000	.366**
		Sig. (2-tailed)	.	.000
		N	210	210
	Age	Correlation Coefficient	.366**	1.000
		Sig. (2-tailed)	.000	.
		N	210	210

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Own processing in SPSS, based on questionnaire data (N= 210).

As shown in *Table 2*, the Spearman test results indicate a statistically significant positive association between respondents' age and the frequency of beekeeping product consumption ($\rho=0.366$, $p<0.001$). The correlation is weak but confirms that as age increases, the frequency of beekeeping product consumption tends to be higher.

Based on the results of the statistical tests, hypothesis H1 is confirmed: there is a statistically significant association between consumers' age and the frequency of beekeeping product consumption.

4.2. Testing Hypothesis H2

Hypothesis H2: The perception of honey as a natural and healthy product influences the preference for direct purchases from beekeepers.

To test this hypothesis, the Chi-square test of independence was applied, evaluating the association between the consumption motivation related to health benefits and the preference for direct purchases from beekeepers.

Table 3 presents the results of the Chi-square test examining the association between the "health benefits" motivation and the preference for direct purchases from beekeepers.

Table 3. Chi-Square test for the association between the "health benefits" motivation and direct purchases from beekeepers

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.916 ^a	1	.088		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.20.

Source: Own processing in SPSS, based on questionnaire data (N = 210).

The Chi-square test results indicate that there is *no statistically significant association* between the perception of honey as a natural and healthy product and the preference for direct purchases from beekeepers ($\chi^2(1) = 2.916$, $p = 0.088$). Although statistical significance is not reached at the 0.05 level, a relevant behavioral trend can be observed: 63.3% of respondents who consume honey for its health benefits prefer to purchase directly from beekeepers, compared to only 48.8% of those who do not cite this motivation.

Therefore, *hypothesis H2 is not statistically confirmed*; however, some behavioral tendencies can be observed, suggesting a potential relationship between health-related motivations and trust in direct purchasing sources.

4.3. Testing Hypothesis H3

Hypothesis H3: The frequency of beekeeping product consumption is significantly influenced by age, gender, the perceived importance of local origin of the products, trust in local beekeepers, and the preference for direct purchases from beekeepers.

To test hypothesis H3, a multiple linear regression was conducted, with the frequency of beekeeping product consumption as the dependent variable and the following independent variables: age, gender (Female/Male/Prefer not to answer), perceived importance of Romanian products, trust in local beekeepers, and the frequency of direct purchases from beekeepers.

The dependent variable ("frequency of beekeeping product consumption") was measured on a five-point ordinal scale (1=not at all, 5=daily) and was treated as a quasi-continuous variable for the purposes of multiple linear regression, which is a common practice in the social sciences.

Table 4. Multiple Linear Regression Results for Consumption Frequency

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.577 ^a	.333	.313	.936

a. Predictors: (Constant), Direct purchase from the beekeeper, Gender, Trust in local beekeepers, Age, Importance of beekeeping products being Romanian

b. Dependent Variable: Consumption frequency

Source: Own processing in SPSS, based on questionnaire data (N = 210).

As shown in *Table 4*, the Model Summary table indicates an $R^2 = 0.333$, showing that 33.3% of the variation in consumption frequency is explained by the proposed model. This suggests a moderate explanatory power of the model.

Table 5. ANOVA Results for the Consumption Frequency Regression

ANOVA^a	Sum of Squares	df	Mean Square	F	Sig.
Regression	88.702	6	14.784	16.883	.000 ^b
¹ Residual	177.755	203	.876		
Total	266.457	209			

a. Dependent Variable: Consumption frequency

b. Predictors: (Constant), Direct purchase from the beekeeper, Gender, Trust in local beekeepers, Age, Importance of beekeeping products being Romanian

Source: Own processing in SPSS, based on questionnaire data (N=210).

Table 5 reports the ANOVA results, indicating that the overall regression model is statistically significant ($F(6, 203) = 16.883$, $p < 0.001$). This confirms that the independent variables jointly explain a significant proportion of the variation in the frequency of beekeeping product consumption.

The individual effects of each predictor are presented in *Table 6*.

Table 6. Multiple Regression Coefficients for Consumption Frequency

Coefficients^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.287	.464		-.619	.537	.881	
Age	.297	.073	.245	4.076	.000	.931	1.135
Gender	.487	.136	.213	3.582	.000	.868	1.075
Importance of beekeeping products being Romanian	.183	.068	.165	2.675	.008	.893	1.151
Trust in local beekeepers	.216	.073	.180	2.963	.003	.909	1.120
Direct purchase from the beekeeper	.422	.141	.183	2.998	.003	.870	1.100

a. Dependent Variable: Consumption frequency

Source: Own processing in SPSS, based on questionnaire data (N= 210).

The analysis of standardized coefficients shows that age ($\beta=0.245$, $p<0.001$), gender ($\beta=0.213$, $p<0.001$), perceived importance of Romanian origin of beekeeping products ($\beta=0.165$, $p=0.008$), trust in local beekeepers ($\beta=0.180$, $p=0.003$), and direct purchase from beekeepers ($\beta=0.183$, $p=0.003$) have a significant influence on the frequency of beekeeping product consumption.

The results of the multiple linear regression confirm hypothesis H3, indicating a positive relationship between consumption frequency and the investigated factors. The regression model is statistically significant ($F(6, 203)=16.883$, $p<0.001$) and explains 33.3% of the variation in consumer behavior ($R^2=0.333$), without presenting multicollinearity issues among the independent variables analyzed.

In the specialized literature, such R^2 values are considered acceptable in social and economic research, given the complexity of human behavior and the influence of multiple factors that are difficult to fully capture in a statistical model. Ozili (2023) notes that an R^2 between 0.10 and 0.50 is commonly found and validated in empirical social studies, confirming that in applied research, lower R^2 values do not invalidate the relevance of a model but rather reflect the variable nature of human behavior. Therefore, an R^2 coefficient of 0.333 indicates a moderate explanatory capacity, suitable for economic and social research.

4.4. Testing Hypothesis H4

Hypothesis H4: Consumers who read labels and consume a greater variety of beekeeping products are more likely to recommend a local producer.

Table 7. Logistic regression results for testing Hypothesis H4

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Frequency of label reading	-.653	.455	2.058	1	.151	.521
	Number of beekeeping products consumed	.538	.420	1.638	1	.201	1.712
	Constant	-2.527	1.458	3.006	1	.083	.080

a. Variable(s) entered on step 1: Label-reading frequency, Number of beekeeping products consumed

Source: Own processing in SPSS, based on questionnaire data (N=210).

To test the hypothesis, a binary logistic regression was conducted, with the dependent variable being the willingness to recommend a local producer and two independent variables: frequency of label reading and number of beekeeping products consumed.

Table 7 presents the results of the logistic regression analysis. The proposed model is not statistically significant ($p>0.05$); however, the coefficients indicate an interpretable trend: the number of products consumed has a positive coefficient ($\text{Exp}(B)=1.712$), suggesting that individuals who consume a greater variety of beekeeping products are more inclined to recommend a local producer.

Unexpectedly, the frequency of label reading has a negative coefficient, but it is not statistically significant ($p=0.151$), which may be explained by more selective consumption behaviors or a relationship mediated by other variables (e.g., distrust in labeling).

The logistic model does *not support hypothesis H4*, but it highlights a potential link between the diversity of beekeeping product consumption and recommendation behavior, which could be further investigated in future research.

5. Results and interpretations of the qualitative research

This section presents the results of the analysis of interviews conducted with beekeepers, aiming to highlight the main entrepreneurial motivations, perceptions of local beekeeping products, challenges faced in their activity, and the relationship between consumer demand and the strategies adopted. The interpretation of responses was carried out through thematic coding, correlating individual opinions in a coherent manner faithful to participants' statements.

5.1. Motivations of beekeeping entrepreneurs

During the interviews, beekeepers' motivations for initiating and continuing activity in the beekeeping sector reflected diverse influences, ranging from family tradition to financial needs and an attraction to nature.

A1 mentioned that passion for bees and family heritage were decisive: *"Passion and pleasure in working with these creatures. I inherited this activity from my grandfather."* Similarly, A4 emphasized the influence of his father in choosing this career: *"The passion came from my father, who has over 20 years of experience in beekeeping."* A7 added that he comes from a family with four generations of beekeepers: *"I am the fourth generation of beekeepers."*

For other entrepreneurs, the decision to start a beekeeping business was influenced by the need for a professional change or economic opportunities. A2 stated that professional retraining and financial motivation were the most important factors: *"The financial aspect mattered a lot. I wanted a different direction, a business."* Similarly, A5 reported that experiences in the corporate environment led him to choose beekeeping: *"After corporate restructurings, I started building a stable business in beekeeping."*

Regarding current motivation, most interviewees highlighted both the passion dimension and the importance of financial sustainability. A1 explained: *"Passion. And financially, but first of all passion. If you do it for pleasure, it's perfect; it's like relaxation for me when I work with the bees."* A2, however, emphasized a shift in priorities: *"Money and passion. Money, first and foremost."* A3 added a philosophical dimension to his activity, stating: *"Beekeeping forces you to live a meaningful life."* Moreover, A6 highlighted the personal satisfaction gained from organizing educational beekeeping workshops: *"I am greatly motivated by the beekeeping education workshops I organize in the summer."*

Concerning previous entrepreneurial experience, A4 and A6 reported that this is their first independent economic activity, while A1, A3, and A5 had other occupations before dedicating themselves exclusively to beekeeping.

5.2. Consumers' perception of beekeeping products

The interviewed beekeepers observed an increasing appreciation from consumers regarding the quality of local beekeeping products. A1 noted that people value, above all, quality and the fact that honey is unprocessed: *"It's one thing to see with your own eyes when you extract the honey, and another to buy honey without knowing what's in it."* Similarly, A3 emphasized: *"People appreciate that the honey is unprocessed and has no additives."* A4 added that the personal relationship and educational support offered to clients are valued as much as the product itself.

Regarding the preference for local products, most beekeepers noticed a growing trend among consumers. A1 stated: *"People look for healthy products, even if they are more expensive."* A4 confirmed this trend: *"I have observed a consistent increase in interest for local products."* A6

explained that access to information has raised consumers' awareness: *"Consumers are now more informed and pay closer attention to what they choose to buy."*

However, perceptions of local beekeeping product consumption vary depending on the context. A2 highlighted that purchasing power has decreased, and for many, beekeeping products are considered remedies rather than regular foods. A5 pointed out that the peak interest in beekeeping products occurred during the pandemic, followed by a decline: *"During the pandemic, demand peaked, and then a decrease was noticeable."*

In terms of consumer feedback impact, several beekeepers implemented changes to meet market needs. A1 observed consumers' preference for acacia honey, which remains liquid, over rapeseed honey, which crystallizes. A3 had to educate clients about the natural crystallization process: *"Many customers do not understand the natural crystallization process and associate crystallization with poor quality."* A4 chose to produce honey from isolated areas to meet the demand for clean, unpolluted products. A6 adjusted the concentration of a product based on consumer suggestions: *"I introduced a 25% version of an apilarnil-based product following feedback."*

Consumers' perception of local beekeeping products reflects an increasing concern for quality, naturalness, and authenticity, leading to continuous adaptations in beekeepers' strategies.

5.3. Main factors influencing beekeeping activities

Regarding the difficulties encountered in beekeeping, most of the interviewed beekeepers highlighted issues related to weather instability, lack of institutional support, and high costs for maintaining apiaries. A1 stated that *"the lack of support, the lack of sources of information, and the unpredictable weather are the biggest problems,"* explaining that *"the acacia bloomed too early, the weather was unusual, and you cannot develop normally."*

A2 also mentioned the challenges faced at the beginning of their activity, declaring that *"there were no trained people to teach you this craft,"* and subsequently, *"the necessary equipment was very expensive."* A3 noted the negative effects of climate change on pollen harvests, emphasizing that *"if pollen is missing, the hives suffer."*

Regarding access to funding, opinions were mixed. A1 stated, *"I did not benefit from funds; I encountered a lot of bureaucracy and excessive documentation."* Similarly, A5 declared that *"I tried to access European funds, but the conditions imposed were unrealistic,"* which led them to give up. On the other hand, A2 managed to develop with the help of European funds through the National Strategic Program, stating that *"without these funds, I don't think I would have managed to reach where I am now,"* while A6 accessed a project worth approximately €14,000 but found that the *"intense bureaucracy and strict conditions"* subsequently led them to invest only from personal sources.

Concerning the management of challenges, A1 noted that *"the funds invested in bees are recovered slowly. I wait and rely on savings."* A3 explained that *"I do not end up with unsold honey because I sell it directly to other beekeepers through an extensive network,"* while A5 emphasized the importance of financial reserves and a rational approach: *"we look for solutions and continue to develop without panicking."*

Among the most frequent problems identified are bee diseases, particularly Varroa infestation. A4 stated that *"these viruses are hard to detect, and often, by the time they take effect, it's too late."* In addition, A7 highlighted the impact of pesticides in agriculture, asserting that *"the major problems are pesticides and chemicals affecting bees,"* and extreme weather events, such as *"heavy rains or heat waves,"* can compromise honey production.

Thus, beekeeping activity is influenced both by natural factors and administrative constraints, requiring beekeepers to find adaptive solutions to maintain the viability of their businesses.

5.4. The Relationship between consumer demand and beekeeper entrepreneurial strategies

Most of the interviewed beekeepers confirmed that consumer demands directly influence their production and sales strategies. A1 stated that *"I adapt my offer based on what people want,"* mentioning the demand for products such as sea buckthorn honey or fir bud honey. Similarly, A2 noted that *"I take customers' demand into account, but I also need to be prepared for other situations,"* adopting a flexible strategy depending on market variations.

Modifications in packaging and labeling represent another way to adapt to consumer preferences. A1 indicated that *"I changed the packaging to make it more attractive,"* while A4 reported that they *"created the label from scratch,"* considering customer feedback, particularly the aesthetic preferences of female consumers.

Regarding product diversification, A6 emphasized that *"customer feedback is the main driver of innovation,"* which led to the adaptation of the product portfolio and improvement of delivery services. Additionally, A7 stated that they consider customer requests to create natural combinations such as *"honey with pollen, propolis, or nuts."*

Development plans reveal varied approaches: A1 aims to *"increase the number of bee colonies to approximately 100 biological units,"* while A5 intends to expand international sales, declaring *"we want to significantly develop the sales area in the UK, France, and Italy."* On the other hand, A6 prefers a moderate growth strategy through diversification, affirming that *"I do not want millions of customers, but ten thousand good and loyal people."*

The analysis of the responses clearly shows that beekeeper entrepreneurs adapt both production and commercial strategies according to market demand and customer feedback, emphasizing quality maintenance and the consolidation of direct relationships with consumers.

The qualitative research results highlight that beekeeping entrepreneurship in Romania is strongly influenced by personal, economic, and social factors. The initial motivations of beekeepers combine tradition with adaptation to market opportunities, and consumer perceptions of local products drive flexible production and sales strategies. Challenges such as climate instability and lack of institutional support are counterbalanced through innovation and orientation toward actual consumer demand. Thus, the close relationship between market preferences and entrepreneurial strategies contributes to strengthening the role of local beekeeping in the sustainable development of communities.

6. Discussion and interpretation of results

The results of both the quantitative and qualitative research highlight the interdependent relationship between consumer behavior and entrepreneurial strategies in Romanian beekeeping. The collected data reflect how market demand influences beekeepers' decisions and, conversely, how their adaptability contributes to consumer loyalty.

The confirmation of hypothesis H1 demonstrates a significant association between age and the frequency of honey consumption. Interviews support these findings, indicating more stable

demand among mature consumers and a higher openness among younger consumers toward local products, providing opportunities for market segmentation.

Although hypothesis H2 was not statistically confirmed, descriptive analysis and qualitative data indicate a strong interest in natural honey and knowledge of product sources, particularly in urban areas. This underscores the importance of traceability and authentic branding.

The multiple linear regression analysis confirmed hypothesis H3, showing that factors such as age, gender, perceived importance of Romanian product origin, trust in local beekeepers, and direct purchase from producers significantly influence the frequency of honey consumption, with a moderate explanatory model ($R^2=0.333$).

Regarding hypothesis H4, although statistical results do not confirm the hypothesis, the qualitative component reveals that product diversification (e.g., honey with natural additives) supports the creation of a loyal and active customer base, strengthening the beekeeping brand.

The qualitative study confirms that beekeepers' adaptability to market requirements is key to the development of the beekeeping business environment. Interview responses highlight frequent modifications in products, packaging, or sales strategies, reinforcing the concept of an adaptive demand-supply cycle.

The main limitations of this research relate to the imbalance in the quantitative sample favoring the under-35 age segment and the potential underrepresentation of regional diversity in the qualitative component. Additional factors, such as income or local culture, were not explicitly integrated, although they may influence consumer behavior. Furthermore, this research can serve as a foundation for future studies, including investigations into successful international models of beekeeping entrepreneurship, with a view toward potential national implementation.

These findings are consistent with previous studies showing that demographic and trust-related factors significantly influence honey consumption patterns (Kowalczyk et al., 2023; Šedík et al., 2023).

7. Conclusions

The research largely confirms the formulated hypotheses, highlighting a significant correlation between consumer profiles and entrepreneurial strategies in beekeeping. The association between age and the frequency of honey consumption supports the idea that older age groups exhibit increased interest, providing opportunities for more effective market segmentation (Kowalczyk et al., 2023; Yüzbaşıoğlu, 2023). Furthermore, the importance attributed to Romanian origin and trust in local beekeepers is reflected in favorable purchasing behaviors, corroborating findings from the specialized literature (Lymperi & Fragkaki, 2020; Šedík et al., 2023). Although the impact of health perception was not statistically confirmed, descriptive data indicate a consistent orientation toward authentic and certified products (Arghiroiu & Beciu, 2023).

Quantitative analysis also revealed a positive influence of factors such as trust in local beekeepers and the perceived importance of Romanian origin on consumption behavior, aligning with observations by Lymperi and Fragkaki (2020) and Šedík et al. (2023). This finding supports the notion that entrepreneurs who promote product authenticity and traceability can benefit from enhanced consumer loyalty.

Qualitative data complemented the analysis, showing that entrepreneurial success is closely linked to adaptability to consumer preferences and product diversification, consistent with contemporary trends (Prodanović et al., 2024).

By correlating the quantitative and qualitative results, it can be concluded that entrepreneurial success in beekeeping depends directly on understanding and integrating consumer preferences, as well as on beekeepers' proactive capacity to adapt production and sales strategies to market realities. This close relationship validates the importance of a flexible and sustainable approach in the development of the Romanian beekeeping sector.

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Appendices

Appendix 1. Socio-demographic data of the consumer respondents

Table 8. Socio-demographic characteristics of consumer respondents in Romania

(N = 210)

Category	Subcategory	Frequency (n)	Percentage frequency (%)
<i>Gender</i>	Female	148	70.50%
	Male	59	28.10%
	Prefer not to answer	3	1.40%
<i>Age</i>	Under 25 years	105	50.20%
	25-35 years	62	29.70%
	36-50 years	27	12.90%
	Over 50 years	15	7.20%
<i>Place of residence</i>	Urban	118	56.20%
	Rural	92	43.80%
<i>Educational level</i>	High school	53	25.40%
	Higher education - Bachelor's degree	91	43.50%
	Higher education - Master's degree	62	29.20%
	Doctorate	4	1.9%

Source: Authors' processing based on questionnaire data.

Appendix 2. Questionnaire on the consumption of beekeeping products in Romania

The questionnaire used in the research aimed to analyze the behavior of consumers of beekeeping products in Romania. It was administered anonymously, and the responses were used exclusively for academic purposes.

Section I - Consumption behavior

1. How often do you consume beekeeping products?
 - Daily
 - Weekly
 - Monthly
 - Less than once a month
 - I do not consume
2. Which beekeeping products do you consume most frequently? *(select all that apply)*
 - Honey
 - Pollen
 - Propolis
 - Royal jelly
 - Honeycomb cappings
 - Other: _____
3. What type of honey do you prefer to purchase? *(select all that apply)*
 - Linden honey
 - Polyfloral honey
 - Acacia honey
 - Rapeseed honey
 - Sunflower honey
 - Manuka honey
 - Other type of honey: _____
4. Why do you consume beekeeping products? *(select up to 2 options)*
 - Health benefits
 - Taste
 - On the recommendation of others
 - Habit / tradition
 - Religious or ritual reasons
 - Other reason: _____

Section II - Purchase and Preferences

5. Where do you most often buy beekeeping products from?
 - Directly from the beekeeper
 - Market / fair
 - Health food store
 - Supermarket
 - Online
 - I do not buy / I receive them from relatives
6. How important is it for you that beekeeping products are Romanian? *(Likert scale)*
 - 1 - Not important at all
 - 2 - Slightly important
 - 3 - Moderately important
 - 4 - Important
 - 5 - Very important
7. What criteria influence your choice of a beekeeping product?
 - Price
 - Taste
 - Packaging
 - Clear labeling
 - Local origin
 - Producer reputation
 - Organic certification

-
- Recommendation from someone
8. How often do you read the label of a beekeeping product before purchasing it?
- Always
 - Sometimes
 - Rarely
 - Never

Section III - Perceptions and trust

9. How much trust do you have in the following suppliers of beekeeping products?

(Likert scale: 1 = none; 5 = very high)

- Local beekeepers
 - Health food stores
 - Supermarkets
 - Online platforms
10. Have you ever had negative experiences with purchased beekeeping products?
- Yes
 - No
 - I do not remember
11. Would you recommend a local beekeeper from whom you have purchased products?
- Yes
 - No
 - I have not purchased directly from beekeepers
12. What type of packaging do you prefer for beekeeping products?
- Glass
 - Plastic
 - Recyclable packaging
 - It does not matter
13. Would you buy beekeeping products directly from a beekeeper through online or phone orders?
- Yes
 - No
 - Maybe, depending on the price and offer

Section IV - Demographic Data

14. Gender:
- Female
 - Male
 - Prefer not to answer
15. Age:
- Under 25 years
 - 25-35 years
 - 36-50 years
 - Over 50 years
16. Place of residence:
- Urban
 - Rural
17. Education level:
- High school
 - Higher education - Bachelor's degree
 - Higher education - Master's degree
 - Doctorate
 - Other: _____

Appendix 3. Interview Guide

❖ Profile of interviewees:

The interviews were conducted with seven beekeeping entrepreneurs from different counties and regions of Romania, selected through convenience sampling. They had between 4 and 43 years of experience in beekeeping and operated under various legal forms of business organization.

❖ Interview period:

The interviews were conducted between April and May 2025.

❖ Ethics statement:

All participants were informed about the purpose of the research and provided their consent for participation and audio recording.

❖ Type of interview:

Semi-structured interview, conducted individually, either face-to-face or by phone.

❖ Purpose of the interview:

To obtain qualitative information regarding the motivations, perceptions, challenges, and strategic decisions of beekeeping entrepreneurs, in order to understand the real mechanisms of entrepreneurship in Romania's beekeeping sector.

❖ Estimated duration of the interview:

25-35 minutes.

❖ Location:

By phone or in person, depending on respondents' availability (at their home or workplace/apiary).

❖ Recording method:

Audio recording, with participants' consent. Transcriptions were produced afterwards for thematic analysis.

❖ Additional techniques applied:

- Reformulation and clarification where needed (probing)
- Encouraging free expression and sharing of personal opinions
- Observation of attitudes and spontaneous reactions (for face-to-face interviews)

❖ Main thematic areas of the interview guide:

Entrepreneurial motivations, perceptions of local beekeeping products, factors influencing beekeeping activity, and the relationship between consumer demand and the strategies adopted by entrepreneurs.

INTERVIEW QUESTIONS

1. What motivated you to start a business in this field?
2. What motivates you the most in what you are doing now?
3. Have you had other economic activities before, or is this your first entrepreneurial experience?
4. What do you notice that people appreciate most about the products you offer?
5. Do you think people are seeking local beekeeping products more than before?
6. Have you received direct feedback from consumers that influenced your activity in any way?
7. What kinds of difficulties have you encountered so far in carrying out your activity?
8. Have you benefited from grants or financial support? If yes, how has this helped you?
9. How do you manage difficult periods or challenges in this activity?
10. Do you take customers' requirements into account when deciding what and how to produce?
11. Have you changed anything in how you market or sell your products based on the feedback received?
12. What development directions do you consider most important for the future of your business?

Appendix 4. General information about participants in the qualitative research
Table 9. General characteristics of the beekeepers interviewed in Romania

Beekeeper Code	Locality	Age	Legal form	Experience	Number of hives	Interview type
A1	Vâlcea	55 years	Sole Proprietorship	over 25 years	~40	<i>phone interview</i>
A2	Tulcea	35 years	Sole Proprietorship	over 13 years	~400	<i>phone interview</i>
A3	Olt	65 years	Agricultural producer	over 43 years	~30	<i>phone interview</i>
A4	Alba	23 years	Family-Owned Business	over 4 years	~86	<i>phone interview</i>
A5	Argeş	45 years	LLC	10 years	~1500	<i>phone interview</i>
A6	Iaşi	42 years	LLC	over 20 years	~170	<i>face-to-face interview</i>
A7	Maramureş	45 years	Agricultural producer	fourth generation of beekeepers	~220	<i>phone interview</i>

Source: Authors' processing based on qualitative interview data.