MAIN DIRECTIONS OF BEEKEEPERS' INTEREST

Marc Loredana Maria *, Liviu Alexandru Mărghitaş *; Anca Aurora Popa*

* University of Agricultural Sciences and Veterinary Medicine, Faculty of Animal Science and Biotechnologies, Calea Mănăştur 3-5, 400372, Cluj-Napoca, Romania;
loredanamaria_marc@yahoo.com

Abstract

Using principal component analysis, the present article describes the trends and main directions of the beekeeping activity. According to the analysis, the present study reveals six main directions of beekeepers. These directions explain 77% of their behaviour. Each factor identified describes a particular beekeeper's direction. The current study does not provide information regarding the reasons why a certain beekeeper direction is the main direction. Thus further qualitative interviews can unveil such aspects, while a quantitative survey might be able to identify a correlation between the quantity sold by each beekeeper and the product policy.

Key words: honey, beekeeping, semi-structured interview, product, package

INTRODUCTION

The purpose of the current paper is the study of the main directions of beekeepers' interest from the marketplace sector from the North-West Region of Romania.

Beekeeping is defined as a science that deals with the growth and reasonable care of bees in order to use their products (Mărghitaş, 2008). Honey is a unique natural product obtained by processing flowers' nectar or plants manna, being used as sweetener or in food industry due to its nutritive, therapeutic and dietetic quality (Vica *et al*., 2009). Unifloral honey is called like this or after the plant from which the nectar originates just if the nectar the bees process is gathered mainly from the flowers of one specific plant species. Polyfloral honey is called like this because the source of the honey is mixed flora (Salonen and Julkunen-Tiito, 2012). Honey's floral source influences directly its composition. On the other hand, external factors such as season, environmental factors, such as physiological stage of the bees and honey processing also influence the composition of honey (Bobiş *et al*., 2007). Honey is a product with minimal types and levels of microbes, due to its chemical composition from which derive their natural properties (Abel Adebayo and Davies, 2012) Beekeepers are divided into the following categories: hobbyists-they have a different job, but practice beekeeping as a hobby; sideliners – that have other income, but practice beekeeping as an additional job for extra money and commercial beekeepers in which case beekeeping is their only source of income (Pocol, 2006).

In the classical sense, the product can be defined as a set of attributes and functional features, combined in an identifiable and tangible form that can be appreciated by means of physical, chemical, technical, economic and aesthetic that gives the property to meet a specific social need. Packaging fulfils a very important role during the marketing and use of products (Diaconescu, 2005).

MATERIAL AND METHODS

Qualitative research methods are employed to uncover other ways of gaining access to such types of data; they seek to answer the 'why' and 'how' questions, rather than the 'what happened' or 'how many' types of enquiry (Baker, 2003). The three main techniques of qualitative research are: group discussions, individual depth interviews and projective techniques. Smith (1998) includes the following categories of depth interviews: mini-depth interview; semi-structured interview; paired interview and triangular interview (Baker, 2003). This method of marketing research is less structured than most quantitative approaches. The researcher must extract meaning from unstructured responses, such as an interview (Zikmund, 2007). One of the main objectives of qualitative research is to gain preliminary insights into decision problems and opportunities (Hair Jr., 2003). The objective of most marketing research projects is to obtain information about the characteristics or parameters of a population. A population is the aggregate of all the elements that share some common set of characteristics and that comprise the universe for the purpose of the marketing research problem (Malhotra, 2007).

The researcher can pick specific individuals with specific characteristics to be included in the sample. In this case the interviewer is free to include in their quota sample individuals who met this specification. If data collectors are given too much freedom to choose their sample, it can be best described as a convenience sample (Palmer, 2000).

A simple definition of semi structured interview is pre-set questions which the interviewer cannot change, but the respondents may reply using their own words. The advantages to this approach include the fact that it addresses more specific issues, responses are usually easier to interpret than other qualitative approaches and cost advantages are over focus groups (Zikmund, 2007).

Principal components analysis (PCA) known also as Hotelling transform or Karhunen-Loeve transform, is a factor analysis technique, in which, the goal is the reducing of variables number initially used, taking into consideration a reduced number of representative variables. PCA is the simplest of the true eigenvector based multivariate analyses. Because in data

of high dimensions, the patters are hard to find, the PCA method is very useful because by reducing the number of dimensions, the patterns can be found without an important information loss. Principal components analysis has found application in fields such as face recognition and image compression (Carbureanu, 2010).

RESULTS AND DISCUSSION

Table 1 presents the variance explained through principal components analysis.

Table 1

Variance explained through principal components analysis

Total Variance Explained						
Component	**Initial Eigenvalues**			**Rotation Sums of Squared Loadings**		
	Total	**Percentage of Variance**	**Cumulative %**	**Total**	**Percentage of Variance**	**Cumulative %**
1	3.71	23.17	23.17	2.69	16.82	16.82
2	2.63	16.46	39.62	2.63	16.41	33.23
3	1.75	10.93	50.55	2.02	12.65	45.88
4	1.56	9.78	60.33	1.75	10.91	56.79
5	1.45	9.04	69.37	1.70	10.61	67.40
6	1.26	7.85	77.23	1.57	9.82	77.23
7	0.94	5.89	83.12			
8	0.81	5.07	88.19			
9	0.66	4.12	92.31			
10	0.46	2.85	95.16			
11	0.37	2.31	97.47			
12	0.21	1.29	98.75			
13	0.11	0.69	99.45			
14	0.06	0.36	99.80			
15	0.03	0.18	99.98			
16	0.00	0.02	100.00			
Extraction Method: Principal Component Analysis.						

Source: Own calculations in SPSS

All parts of the description: type of honey, packaging, information on these data is complex with numerous correlations and links. To reduce this complexity and to easily understand what are the trends and main directions in which we can describe the activity of beekeeping, principal

component analysis is used as a tool that allows on one hand, to detect structures in a set of variables and, on the other hand, to reduce the size of data that works by extracting components/factors. These factors are a linear combination of the variables included in the model and explain to some extent the variance of the original variables, the number of factors may be increased or decreased depending on the value of a limit factor (eigenvalue) which by default is 1.

By applying this technique we get six factors explaining 77% of the variance. This value is very high and we confirm that the model considered is a good one. More exactly, the 6 factors are actually the 6 lines of description of beekeepers, directions which explain 77% of their behaviour (only behaviour variables measured by semi-structured interview).

Table 2 presents the variables included in each factor and their weight within each factor. Therefore, each factor can be understood and named.

First factor: tends to characterize the convenient use of a plastic package of 500 grams and no trading interest or complicated acacia honey packaging by displaying additional information such as degree of naturalness. Therefore we could call this direction as "convenience or simply and effectively".

The second factor: marketing is characteristic of other types of honey than polyfloral and packaging specification refers to storage conditions and shelf life. So we could call this direction as "maintaining product quality".

The third factor is dedicated to honey and linden taste specify on the package. This directly relates to stimulate your sense of taste by offering a unique product, so it is a course dedicated to "product flavour".

The fourth factor indicates the product identified by classical elements: name, price and grams. So it is factor "basic product identification".

The fifth factor relates to the colour and composition of honey and is somewhat adjacent to the third factor, so we can call as "the quality of the picture".

The last factor characterizes the origin of honey and is shown separately because this is for connoisseurs important, sometimes significantly depending on product properties such collection area. This last factor we will call "provenance".

Table 2

Principal components analysis

Rotated Component Matrix(a)						
	Component					
	1	2	3	4	5	6
Plastic	0.826					
Acacia honey	-0.812					
Weight 500g	0.584			-0.458		
Degree of naturalness	-0.570					
Storage conditions		0.903				
Validity period		0.815				
Polyfloral honey		-0.665				
Taste			0.824			
Producer			-0.684			
Linden Honey			0.620			
Full name of the product				0.720		0.435
Price				0.651		
Weight 400g	-0.517			0.552		
Color					0.844	
Product composition					0.699	
Area of origin						0.947

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 24 iterations.

Source: Own calculation in SPSS

CONCLUSION

The present article highlights the principal component analysis method application utility in beekeeping activity, with the final goal of identifying those factors which influence in a significant way the beekeepers from market place, in the actual context of globalization and accelerated development. This type of application has direct effects in the possibility of analysing, testing and improving those factors which are directly responsible with the quality of beekeepers' products.

REFERENCES

1. Abel Adebayo, A., B.A. Davies, 2012, Microbiological examination of honey marketed in southwestern Nigeria. J.Basic.Appl.Sci.Res. 2(2):1701-1705.
2. Baker M.J., 2003, The Marketing Book-fifth edition, Butterworth Heinemann
3. Bobiş, O., L.Al. Mărghitaş, V. Bonta, D. Dezmirean, O. Maghear, 2007, Free phenolic acids, flavonoids and abscisic acid related to HPLC sugar profile in acacia honey. Bulletin USAMV 63/64: 179-185.
4. Carbureanu M.,2010, A factor analysis method applied in development field, Annals of Constantin Brancusi University from Targu Jiu, Economy series, 1:187-194
5. Diaconescu M., 2005, Marketing Agroalimentar, Academic publishing, Bucharest
6. Hair Jr J.F., R.P. Bush, D.J. Ortinau,2003, Marketing research-within a changing information environment, McGraw-Hill Irwin
7. Malhotra N.K., D.F. Birks, 2007, Marketing research an applied approach-third edition, Prentice Hall Financial Times
8. Marghitas L.Al., 2008, Albinele si produsele lor, Ceres publishing, Bucharest
9. Palmer A., 2000, Principles of Marketing, Oxford University Press, USA
10. Pocol C.B., L.Al. Marghitas, 2006, Factors that influence supply and demand for bee products, Bulletin USAMV, 62/2006, 133-136
11. Salonen, A., R. Juljunen-Tiitto, 2012, Characterization of two unique unifloral honeys from the boreal coniferous zone: lingoberry and mire honeys. Agricultural and Food Science. 21(2):159-170.
12. Vica, M., M. Glevitzky, G.A. Dumitrel, M. Popa, S. Varvara, 2009, Microbiological role in hazards analysis of natural honey precessing. J. Agroalimentary Processes and Technologies 15(3):353-360.
13. Zikmund W.G., B.J. Babin, 2007, Exploring marketing research-ninth edition, Thomson South-Western