Analyzing Consumers' Preferences for Apples in Pristina, Kosovo

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Das Analysieren der Einstellungen von Verbrauchern für Äpfel in Pristina, Kosovo

1 Introduction

Apples are one of the main fruits traditionally consumed by Kosovar households and produced by agriculture holdings. In terms of the cultivated area, apples are ranked on the first place, followed by plums and pears. (MAFRD, 2013). According to a recent study on consumer preferences for food products in Kosovo, the most commonly consumed fruit is apple – about 79 % of the interviewees eat apples always or often. Most consumers state that it is costumary in their respective families to ingest fruits in general, specially apples (FAO, 2014).

Consumers consider domestic apples of higher quality compared to imported apples – about 80 % perceive domestic fruits in general and apples specifically, as high quality. Most consumers (approximately 70 %) are willing to pay a price premium for domestic fruits – this figure is slightly higher for apples (almost 75 %). In addition, there

Zusammenfassung

Dieses Papier zielt darauf ab, Licht auf Verbraucherpräferenzen für Äpfel in Pristina, Kosovo zu werfen, indem es ein verbundenes auserlesenes Experiment anwendet. Zu diesem Zweck wurden Verbraucher in vier Gruppen klassifiziert, abhängig von deren Kategorie sie bevorzugten: Vielzahl (Farbe), Preis, Ursprung und Art (organisch gegen nicht organisches). Die Ergebnisse zeigten, dass Vielzahl bei weitem das wichtigste Attribut für drei aus den vier identifizierten Verbraucherklassen heraus ist. Ist das wichtigste Attribut für die größte Verbraucherklasse organisch, die mehr als Hälfte der Verbraucher der Übersichtsprobe zur Folge hat. Ursprung ist auch ein wichtiges Attribut für die größte Verbraucherklasse – es gibt eine bedeutende Präferenz für inländische Äpfel. Die zuverlässige lokale Brandingentwicklung, kombiniert mit Förderung der organischen Produktion sowie die Unterstützung durch zuverlässige Drittparteibescheinigung, sollten für die Durchführung von Geschäftsstrategien und von Stützpolitik betrachtet werden.

Schlüsselwörter: Äpfel, verbundenes auserlesenes Experiment, Verbraucherpräferenzen, Kosovo.

Summary

This paper aims to cast light on consumer preferences for apples in Pristina, Kosovo, by applying a Conjoint Choice Experiment. For this purpose consumers were classified in four groups, depending on which category they favoured: variety (color), price, origin, and type (organic vs. non organic). The results showed that variety is by far the most important attribute for three out of the four identified consumer classes. Organic is the most important attribute for the largest consumer class, which entails more than half of the consumers of the survey sample. Origin is also an important attribute for the largest consumer class – there is a significant preference for domestic apples. Reliable local branding development, combined with organic production promotion, as well as support through reliable third party certification, should be considered for the enforcement of business strategies and support policies.

Key words: Apples, conjoint choice experiment, consumer preferences, Kosovo.

is a strong preference for organic produced apples as confirmed by most interviewees (ca. 85 %) who are willing to pay a premium for organic fruits (Table 1).

Despite the local consumer preferences for domestic apples, Kosovo continues to import a significant amount of fresh apple. Imports cover about 1/3 of the domestic supply for fresh apples (Table 2). High imports signal a market opportunity for local producers – but it is necessary to achieve a better perception of consumer preferences, in order to develop a successful marketing strategy. Understanding consumer preferences and behaviour is essential for the decision-making process of key stakeholders, including apple producers and traders, as well as donor agencies that operate in the sector. This is particularly important, considering that import substitution could be more feasible than export promotion in the near future.

In the last years, there has been an increasing support of the agriculture sector from the side of the Kosovan government; however, it was only recently that the fruit sector has received financial support. Governmental support schemes should take into consideration the importance of varieties and production technology in the context of their support schemes targeting fruits (apple). Therefore, providing information about the type of apples, which are mostly demanded by various market segments, might be useful to prepare more specific and efficient support schemes.

2 Objectives

The goal of this study is to analyze consumer preferences for apple fruits in Pristina, Kosovo. Specifically, the research objectives are to:

Table 1: Willingness to pay for domestic fruits against the imported ones
Tabelle 1: Bereitwilligkeit, für Innenfrüchte gegen die importierten zu zahlen

Category	Indicator	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly disagree	Total
Domestic apples are of high quality	Frequency	1	7	47	162	81	298
	%	0.3%	2.3%	15.8%	54.4%	27.2%	100.0%
I would pay a higher price for domestic fruits compared to imported fruits	Frequency	6	15	67	122	84	294
	%	2.0%	5.1%	22.8%	41.5%	28.6%	100.0%
I would pay a higher price for domestic apples compared to imported apples	Frequency	3	14	58	130	91	296
	%	1.0%	4.7%	19.6%	43.9%	30.7%	100.0%
I would pay more for organic apples than for other conventional apples	Frequency	3	7	30	112	143	295
	%	1.0%	2.4%	10.2%	38.0%	48.5%	100.0%

Source: FAO (2014)

Table 2: Apples production and supply in Kosovo
Tabelle 2: Apfelproduktion und Versorgung in Kosovo

Category	Unit/Year	2006	2007	2008	2009	2010	2011	2012
Production	Mt	20,112	16,233	22,234	22,898	24,758	24,604	15,243
Import	Mt	10,759	9,929	9,684	11,161	12,221	11,084	7,134
Export	Mt	19	3	63	5	7	3	11
Supply[1]	Mt	30,852	26,159	31,855	34,054	36,972	35,685	22,366
Export/import	%	0.18%	0.03%	0.65%	0.04%	0.06%	0.03%	0.15%
Production/supply	%	65.2%	62.1%	69.8%	67.2%	66.9%	68.9%	68.1%
Import/supply	%	34.8%	37.9%	30.2%	32.8%	33.1%	31.1%	31.9%

[1] Supply = Production – Export + Import

Source: MAFRD, 2013, Green Report, page 31

1) Group consumers according to their preferences in relation to the main apple attributes.
2) Analyze consumer preferences for each of the identified consumer classes.
3) Provide marketing and policy recommendations for the sector's stakeholders, with particular focus on producer associations, traders and policy-makers.

3 Methods and Procedures

The proposed method for this research is Conjoint Analysis (CA), which was first proposed by LANCASTER (1966) and postulates that the consumer utility is based on the bundle of attributes a product represents. Later, CA has been widely used to assess consumer preferences, beginning with GREEN and RAO (1971) and JOHNSON (1974). Its advantage compared to other methods, is that it is based on different product attributes; for each attribute there are several levels that enable assessment of consumer preferences for the products through partial contribution of product features (HAUSER and RAO 2004). LOUVIERE and WOODWORTH (1983) improved the method introducing Choice Based Experiment or Cojoint Choice Experiment (CCE). The main advantage of CCE over conventional CA is that, in CCE respondents pick their favored option out of several choice sets, therefore the trade-off can be measured in line with the respondents' weight in choosing one attribute over another (HAAIJER 1999).

This approach enables to obtain consumer classes, each class including information on the preferred product's attributes and the group's willingness to pay for it. As a result, various producers and traders can identify the most suitable market niche/segment to target.

CCE has been used in previous studies on fruits (BARBER et al., 2008; EVANS 2008) and specifically for the reasearch on apples (WIRTH et al. 2011; NOVOTOROVA & MAZZOCCO, 2008; SUN and WANG, 2002; JERKOA & KOVAČIČ, 2008; MANALO 1990; SKRELI & IMAMI, 2012). These studies have grouped consumers by their preferences for various product attributes and have assessed their willingness to pay, thus providing important indications and recommendations to agri-food marketing enterprises and to policy-makers. In our study Conjoint Choice Experiment (CCE) was chosen to design the survey, and Latent Class Analysis (LCA) to analyze the data – combining CCE with LCA is termed "Conjoint Choice Design". Sawtooth Software SSI Web v 6.6 was used to design the survey and to prepare the data for processing, while Sawtooth Software Latent Class for CBC v 4.0.8 was used for data processing.

3.1 Conjoint Choice Design

In order to determine apple consume preferences in Pristina, five stages of Conjoint Choice Design (including Latent Class Analysis) were taken into consideration. Table 3 gives a brief description of the design stages of a CCE combined with LCA.

Regarding the experimental design approach offered by Sawtooth Software SSI Web v 6.6, Complete Enumeration Option (rather than Balanced Overlap or Random Enumeration) was used as task generation method. It was opted

Table 3: Design stages for a CCE
Tabelle 3: Designstufen für einen CCE

Stage	Description
Selection of attributes	Selection of apple attributes has been done based on literature review, expert interviews and focus group discussions.
Assignments of attributes level	The range of attributes is also based on focus groups, literature review, expert interviews and observed market conditions. The attribute levels have been assigned reasonably and realistically.
Choice of experimental design	Randomized design (complete enumeration option) is used to create choice tasks in such a way, to reduce the possible combinations of attribute levels and also estimate models efficiently.
Construction of choice sets	The concepts identified by the experimental design are then paired and grouped into choice sets to be presented to respondents.
Data analysis	Latent class analysis has been used to analyze consumer preferences.

Source: CHAN-HALBRENDT et al., 2010

for full randomization of profiles across the choice tasks, since no concept sorting was applied.

3.1.1 Selection of Product Attributes and their Levels

Product attributes and their levels have been selected based on literature review, expert assessment and focus group discussions. Two focus groups discussions were organized; one focus group with consumers and another one with agri-food marketing experts. As a result, the most important apple attributes and their respective levels were identified. The attributes identified were: color (variety), origin, price, and type (organic versus non-organic). Other attributes were identified through focus groups and literature review, such as: level of damage on the fruit, pesticide usage, assurance of compliance with food safety regulations (see BAKER, 1999) texture, taste and flavor attributes (see DAILLANT-SPINNLER et al., 1996). Nevertheless, this were not selected due to difficulty to be assessed by the consumer and to be scaled accordingly in the questionnaire.

3.1.1.1 Color (variety)

Color has consistently been an important attribute in previous fruit and vegetable analyses. In some studies (RICHARDS and PATTERSON, 2000), apple cultivars are subject of different patterns of demand and purchasing habits. The relative importance for apples' color was 20 % in MANALO'S study (1990) and 17.98 % in JERKO and KOVAČIČ'S study (2008). SKRELI and IMAMI (2012) found that variety was the most important attribute for three out of four identified consumer classes. In our study we have chosen to link color and variety, since most consumers in Kosovo do not recognize apples by their variety name, but by color. In the questionnaire, the name of the variety was written alongside its respective color, in order facilitate its identification by consumers that do not recognize it by name.

3.1.1.2 Origin

Origin is an important attribute for agri-food products. JERKO and KOVAČIČ (2008) found that the relative importance of origin for apple was 20.94 %. DENTONI et al. (2009) identified that consumers prefer locally grown apples over imported ones in USA. FAO (2014) detected a willingness to pay a premium for locally grown fruits in Kosovo – however this study was not based on an experiment and did not provide any market segmentation.

3.1.1.3 Price

Although price is not technically a product attribute, it is commonly included as such in Conjoint Analysis, mainly because it is a major factor of influence on buying choices.

3.1.1.4 Organic

Various studies have included the method of production and environmental practices as product attributes. BAKER (1999) found that consumers expressed a broad preference for reduced pesticide usage. LOUREIRO et al. (2001) also observed that there is a positive WTP for organic apples. According to LOUREIRO et al. (2001), presence of children in the household, small family size, higher food safety concerns and attitudes about the environment tend to increase the likelihood that a consumer will prefer an organic product.

NOVOTOROVA and MAZZOCCO (2008) as well as SUN and WANG (2002) detected that consumers in USA rank the method of production as highly important – there is an overall preference for organically produced versus conventionally (non-organic) produced apples. Also JERKO and KOVAČIČ (2008) came upon similar results in a study carried out in Croatia.

The attributes included in this study are represented by categorical variables, which imply decision-making on the number of attribute levels. Three colors (red, yellow and

Table 4: Apple attributes and their level
Tabelle 4: Apfelattribute und ihr Niveau

	Attributes			
	Color (Variety)	Price (EUR/Kg)	Origin	Type
Atribute level	Red (Red delicious)	0.6	Imported	Organic
	Yellow (Golden delicious)	1.0	Local	Not organic
	Green (Granny Smith)	1.4		

green), corresponding to the three most common varieties consumed in Kosovo (Red Delicious, Golden Delicious and Granny Smith) represent the three levels of attribute "color" (Table 4). Domestic and imported are the two levels for the attribute "origin". The attribute "type" consists of organic and conventional (non-organic) apples. The levels for apple's price have been decided based on consumer focus groups, expert interviews and market observations.

3.1.2 Choice of Experimental Design and Construction of Choice Sets

Regarding the experimental design, randomized design (complete enumeration option) was used for generating the choice tasks. In complete enumeration, profiles are nearly as orthogonal as possible within respondents, and each two-way frequency of level combinations between attributes is equally balanced. Within choice sets, attribute levels are duplicated as little as possible (a property called "minimal overlap) KEITH CHRZAN and ORME 2000.

Twelve choice tasks of triple concepts were included in each questionnaire, and each respondent was asked to choose 12 concepts, one for each triple choice tasks. Seven questionnaire versions were generated, which enabled the inclusion in the questionnaire of 84 choice tasks and 252 concepts of 4 attributes each (refer to Figure 1 for an example of choice sets).

3.1.3 Latent class analysis

The latent class analysis is one of the most recent models to investigate preference heterogeneity; earlier applications of the approach assumed homogeneous preferences across respondents, though preferences are in fact heterogeneous. The approach depicts a population that consists of a finite and identifiable number of segments of individuals. Preferences are relatively homogeneous within segments, but differ substantially from one segment to another. The number of segments is determined endogenously by the data. Belonging to a specific segment is probabilistic, and depends on both respondent choices and characteristics.

The Latent Class Model is a random utility model. According to the seminal work of MCFADDEN (1973), consumer utility can be represented as follows:

$$U_{ijt} = \beta X_{ijt} + \varepsilon_{ijt} \tag{1}$$

The subscript i refers to individual i; j refers to concept (profile) j, while t refers to choice set t. The utility level Uijt is a linear function of observable vector of attributes xijt and its coefficient to be estimated, β. εijt is a random error term, which captures all the unobservable attributes and factors that influence the choice process.

MCFADDEN (1974) showed that the probability that concept j in choice set t is chosen by individual i is given as:

$$P_{ijt} = \frac{\exp(X_{ijt}\beta)}{\sum_{k=1}^{J} \exp(X_{ikt}\beta)} \tag{2}$$

The numerator is the exponent of the observable utility of concept j in choice set t, and the denominator is simply a collection of observable utility from all available concepts.

In LCA, respondents are grouped according to their choices in the CCE. The choices that respondents made are considered based on their attribute preferences and their socio-demographics. In our study, only product attributes (color/variety, origin, size and type) were taken into account, therefore an individual's probability of choosing concept j was considered as a function of apple attributes. The socio-demographic variables have not been considered, due to software limitations.

Apple		
Imported	Domestic	Imported
Green (Granny Smith)	Yellow (Golden Delicious)	Red (Red Delicious)
Organic	Organic	Not organic
1.4 EUR (per kg)	0.6 EUR (per kg)	1 EUR (per kg)
I would choose		
↓	↓	↓
☒	☐	☐

Figure 1: Example of choice sets used in the survey
Abbildung 1: Das Beispiel von Auswahlen im Überblick verwendet

3.2 Sampling and Data Collection

GREEN and SRINAVASAN (1978) suggest a minimum sample of 100 respondents for Conjoint Analysis Studies – in our study, 216 valid questionnaires were produced. Interviews were carried out by trained graduate students in Pristina, the largest town in Kosovo, where the purchasing power is concentrated. The interviews were carried out at various sites – people were approached randomly and after completing each face-to-face interview, interviewers would approach the next closest person.

Table 5 shows the gender and age structure of the survey respondents.

Table 5: Socio-demographic comparison between survey respondents and Pristina's population
Tabelle 5: Sozialdemografischer Vergleich zwischen Überblickbefragten und Pristinas Bevölkerung

		Survey Respondents	Prishtina Population
		(%)	(%)
Gender	Female	52.3	50.0
	Male	47.7	50.0
Age2	18–24	20.8	15.8
	25–30	18.5	14.6
	31–35	13.4	13.1
	36–40	14.4	11.2
	41–45	10.6	10.2
	46–50	3.7	9.2
	51–55	6.5	7.9
	56–60	4.6	6.2
	61–64	2.8	4.9
	65 and up	4.6	6.8

Source: Kosovo Statistical agency (Pristina's population figures)

4 Results and discussions

4.1 Number of Classes, Class Size and Importance of Attributes

The decision on the number of classes is guided by statistical decision criteria and by the interpretability and simplicity of the model (BOXALL and ADAMOWICS, 2002). Consistent Akaike Info Criterion (CAIC) suggests that a four class model is superior compared to two, three and five class models.

Class 1 is the largest consumer class, which comprises 57 % of consumers. For consumers in Class 1 the most important attributes are type, price and origin. Class 2, 3 and 4 are smaller consumer classes compared to Class 1 – they represent respectively 13 %, 13 % and 17 % of the sample. For these classes the most important attribute is variety (color) – the level of importance of this attribute is 79 %, 82 % and 86 % respectively (Table 6).

Table 6: Class sizes and importance of attributes
Tabelle 6: Klassengrößen und Wichtigkeit von Attributen

	Class 1	Class 2	Class 3	Class 4
Share of each class	57.1 %	12.9 %	13.0 %	17.0 %
Importance of attributes (%)				
Origin	25.6	6.7	4.5	0.4
Variety	7.7	78.8	81.7	86.1
Type	39.6	10.6	4.0	7.5
Price	27.1	3.9	9.8	6.0

4.2 Consumer Preferences

Consumers in Class 1 have a strong preference for domestic and organic apples (which are among the main attributes in terms of importance). This consumer class is also price sensitive – thus, organic and domestic apples are preferred provided a certain price.

Consumers in Class 2 have a strong inclination for green apples (Granny Smith), since it is the most important attribute for this class. Class 2 consumers prefer organic apples and are price sensitive, similarly to consumers in Class 1. Nevertheless, they show no particular preference regarding origin.

Consumers in Class 3 opted for yellow (Golden Delicious) against other varieties (also for this class, variety is the most important attribute). Contraty to our expectations, the price coefficient turned out positive, thus implying that price is a proxy for quality – higher prices signal higher quality for consumers of this class. Also, consumers did not show any preference for type (organic versus conventional apple) or origin (Table 7).

Class 4 consumers did not show any decided preferences, other than for the apples to be red (Red Delicious) – inclinations for other attributes were not significant.

Table 7: Parameter Estimates
Tabelle 7: Parameterschätzungen

	Class 1		Class 2		Class 3		Class 4	
Variety	Utility(β)	T	Utility(β)	t	Utility(β)	t	Utility(β)	t
Origin								
Domestic	0.20173***	6.96767	0.25165	1.53409	-0.14224	-0.53653	-0.01108	-0.04423
Imported	-0.20173***	-6.96767	-0.25165	-1.53409	0.14224	0.53653	0.01108	0.04423
Variety								
Yellow (Golden Delicious)	-0.06269	-1.62427	-0.20045	-0.53685	3.31450***	9.97798	-1.87588***	-4.14887
Red (Red Delicious)	0.05943	1.57715	-2.87938***	-4.39913	-1.45237***	-3.24470	3.34659***	11.28591
Green (Granny Smith)	0.00326	0.08531	3.07983***	8.70847	-1.86123***	-3.72913	-1.47072***	-3.68749
Type								
Organic	0.31208***	10.60166	0.40009***	2.24833	0.12560	0.45499	0.22785	0.88743
Not organic	-0.31208***	-10.60166	-0.40009***	-2.24833	-0.12560	-0.45499	-0.22785	-0.88743
Price								
Price	-0.21391***	-6.43018	-0.14944***	-0.77779	0.31001***	0.95539	0.18040	0.61825

*** Significance at 0.01 levels

5 Conclusions and Recommendations

This paper casts light into into apple consume patterns in Kosovo, through the performance of a Conjoint Choice Design. Consumers were grouped in four classes, according to their preferences for the main apple attributes. Preferences were analyzed for each of the identified consumer groups.

Variety is by far the most important attribute for three out of four consumer classes. This result is similar to Albania (which has cultural similarities with Kosovo) (Skreli and Imami, 2012). Also Jerko and Kovačič (2008) have found this attribute to be important in Croatia (also located in the Western Balkan). Preferences for variety/color differ across consumers' groups. Consumers in Class 2 have a strong preference for green (Granny Smith) apple, while consumers in Class 3 and Class 4 prefer yellow (Golden Delicious) and red (Red Delicious) respectively. Producers and policymakers should take into consideration consumer preferences for these varieties specifically.

Organic is the most important attribute for the largest consumer class (Class 1), which entails more than half of the consumers. However, production and sale of organic apples is not common in Kosovo and most consumers have limited or no understanding of organic production (FAO, 2014). Thus, addressing consumer's awareness about organic food should be considered. Origin is also an important attribute for the largest consumer class – there is a significant preference for domestic apples. This results correspond with other studies in Kosovo (FAO 2014), Croacia (Jerko and Kovačic 2008) and Albania (Skreli and Imami 2012).

In conclusion, domestic fruits, particularly domestic organic (certified) fruits have a great advantage in the domestic market. In order to benefit from this fact, the Ministry of Agriculture, Forestry and Rural Development (MAFRD) and farmers' associations of the sector should join efforts towards reliable local branding development and organic production certification, thus providing for sales consistency and consumer satisfaction. Additionally, since consumers may associate organic food with food safety and quality, it would be favourable to promote education on organic production, which could be organized, for example, by farmers' representatives, public institutions and civil society, including media. On the other hand, market related institutions should promote the recognition and the rigorous application of local cultivar/brand quality standards.

This study has also some limitations. Socio-economic determinants of consumer choices were not addressed due to lack of appropriate software – future studies may address

them. Limitation only to the Pristina market (despite being the largest city and the most important market in Kosovo) may produce biased results, therefore some precaution is advised when generalizing the results to a country level. However, this study has the merit of applying for the first time Conjoint Choice Design for the analysis of consumer preferences in Kosovo, as well it is the most in-depth study on consumer preferences for apple in Kosovo to the best of the authors' knowledge.

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