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Potato consumption factors in developing countries: Case of Turkey

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ABSTRACT

Potato has been determined as the food of future on global extent. Within this study factors affecting potato consumption were evaluated in the scope of domestic market. The main reasons behind the choice of potato consumption were its reference as future's product as well as today's, and the possibility to consume potato both as fresh and processed forms. In order to underline the detailed reasons, 3.072 consumers were surveyed between August and September 2020. Due to the findings, factors affecting potato consumption in the domestic market were detected as consumer awareness, consumer value and consumer convenience. These factors reflect the health awareness developed among the society within the pandemic process. This finding put forward that there is a need for public promotion of potato with reference to its food content and positive health impact. On the other hand, due to partial and complete shut-down implementations processed potato consumption has reduced and home-made fresh potato consumption has risen. This has been acknowledged as a social progress with respect to direction to healthy consumption. A declination in potato consumption was detected among two-thirds of the households due to rising prices. These findings indicated factors that affect purchases or consumption of a specific product or services under normal and extraordinary conditions need to be known. This is important for sustainability of social health and quantitative and qualitative estimation and management of both national and international market demand.

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Introduction

Agricultural products are of great importance globally due to the nutrition of the society and they are as more strategic due to aggregate change and development. Healthy nutrition of the society is essential for sustainability of societal health and food safety and food security have become rather critical for almost all countries. Potato has been considered as an essential consumption product with its nutritional value and taste and has been consumed as fresh or processed. It is being consumed fresh on household level while is used as processed in food production and services providers fast-food venues and café/restaurants. Potato is a fundamental product that has no competitor in the relevant fields. Due to partial or complete shut-downs observed consumption trend for fresh potatoes seemed to rise, while processed consumption has reduced.

Receiving initial attention in the Americas, potato has become an important and fundamental food product around the world within centuries (Beals, 2019). Potato is contributory to main diets with its vitamin C, potassium, and fibre content (Mc Gill et al., 2013). Some research supported the idea that potato has effect on repletion (Akilen et al., 2016; Geliebter et al., 2013; Holt et al., 1995). Accordingly, potato is an important energy source, meeting main food demand of people especially in less developed countries (Arıoğlu, 1997).

Potato has been consumed mostly in fresh form around the world that the average fresh consumption rate is 67% according to FAO data. The rate has been higher in Ruanda (92.5%), UK (89.4%), Iran (89.4%), Australia (89.3%) and Italy (89.2%). On the other hand, the average was lower in Denmark (19.7%), Ukraine (30%) and Netherlands (42.1%). The rate for Turkey was also higher than average with

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88.1%. The amount and type of potato consumption varies among countries due to their development level and consumption culture. Average potato consumption per person in the EU 28 was 61.3 kg, while world average was 32.9 kg according to 2018 FAO data. The average for less developed countries was 19.4, and it was 46.8 kg for Turkey (FAO, 2021).

Potato has been considered as a primary consumer good with its high nutritive value especially for low-income countries due to rising population and estimated future food shortages (FAO, 2009). Accordingly, it was estimated that market development for potato and production and consumption planning will become more important in the close future (Keijbets, 2008). When the level of consumption was overviewed, it was understood that per capita fresh potato consumption has been in declination in Europe while it is rising in developing and underdeveloped countries. Yet, potato can become an important discussion topic as being a compulsory agriproduct due to rising prices, as a result of declining internal supplies and rising costs attached to increasing imports. This varying situation leads to acknowledgement of potato as a luxury good by consumers who have low or middle income and declining demand.

The relationship between prices and consumption amount of agri-food products and consumer's welfare is rather strong. Demand for agri-food products do change and there are two phases that should be evaluated. In the first phase, price and income are rather effective for consumption demand and consumers tend to demand more of a concerned product. On the contrary, the impact of price and income decline in the second phase and consumers' sensitivity regarding health, variety and ease of approaching the product rises. Consumers tend to consider, fat content, calory and vitamin content more and desire to reach and purchase different varieties within a high-paced easy process. The interest on natural products with minimum chemical residues and focus on environmental consciousness rise in the third level. Besides, consumers tend to purchase natural but non-labelled products and even accept to pay more for these specialities (Yurdakul & Koç, 1997).

The most important environmental factor that marketing management fails to control is consumer itself. The reasoning behind is the ambiguous effect of environmental challenges on consumer that cannot be pre-estimated accurately. Accordingly, consumers are being surveyed and searched frequently by companies and organisations especially in developed countries (İslamoğlu, 2000). Contemporarily, consumer-oriented marketing has become prevalent in all sectors including agriculture, industry, and services. Consumer oriented marketing management embrace development of effective marketing policies and strategies directed to target markets by the public and private sectors that is expected to contribute profitability, social utility production and sustainability of all organisations. Therefore, there is a need for detailed analysis on market and product/service level. When all citizens are considered as consumers for specific markets or products, it is important to determine needs, wants and tendencies of consumers respecting the structural features of the markets.

There are significant number of studies on potato. A few of those can be visited.

Lazarus and White (1984) searched effects of environmental conditions on potato production in New York. Moazzem and Fujita focused on the economic relations between Bangladeshi potato producers, traders and cold storage operators. Kızıloğlu (1994) calculated factors that affecting potato cultivation field and costs. The factors that affected potato production in Turkey were estimated with demand and supply equations using 1963–1997 data by Dağdemir and Birinci (1999). There has been another study concerning potato producers' entrepreneurial status and problems they faced (Şahin, 2003), cost and revenue structure evaluation (Birinci and Küçük, 2006), econometric analysis of production of different potato varieties with Cobb-Douglas production function (Engiz, 2007); effects of prices on cultivation area and production amount of storable products as potato, onion, garlic, aubergine (Balgalmiş Kunt, 2009). Potato exports of Turkey was studied to reveal Turkey's advantages (Engindeniz & Karakuş, 2008). In addition, Loader (1997) studies marketing system and marketing network relationships between Egypt and the UK for fresh potato. Egyptian potato exports (Elawady & Abdulkheir, 2015) and Kenyan potato production structure (Janssens et al., 2013), profitability and technical efficiency of potato and pineapple produced in southwestern Uganda were surveyed. SWOT analysis of potato production was made for India (Rana et al., 2017), and potential for potato production rise in India was studies by Rana and Anwer (2018). Producers' situation to accept cultivation of a genetically modified Bintje variety potato was searched for Belgium (De Steur et al., 2019). Ahmed and Mohamed (2020) studied cyclical potato price fluctuations for the UK, Germany and Russia. In addition to production-based studies, consumer preferences were studied in detail. Jemison et al. (2008) stated that the colour and shape of potato have

significant importance in consumer decisions. Yue et al. (2008) studied factors affecting German consumers' behaviors in comparing traditional and organic potato. The factors affecting market preference of Red, Russet, Yukon and organic potato in New England was searched (Greenway et al., 2010). Besides, İkikat Tümer and Aksoy (2019) searched factors affecting consumers potato purchasing preferences in Erzurum province of Turkey with analytical hierarchy process. When we evaluate the studies on potatoes, it can be said that most of the research on potato have been related with its production and consumption level studies are rather limited. With reference to aim, methodology and field restrictions, this research is different from the previous studies. Factor Analysis used in this study also is a different approach and will be considered as contributory. In addition, the sample of the study was comprised of household data retrieved from all Turkey. Therefore, the scope of the study focusing on analysis of consumer behaviors was considered to add on the literature as well.

To sum up, it was intended to determine consumer behaviors and determine factors affecting consumption of potato in Turkey as being a developing country. Potato is both necessary and questionable in terms of health compatibility due to its consumption form. While potato is considered as healthy with its content when consumed freshly, its processed consumption (French fried, chips, etc.) is regarded as unhealthy. Therefore, studying consumer behaviors for potato was considered as essential from producer/supplier, consumer, and health management aspects.

Material and methodology

Main material of the research is consumer data retrieved from districts that most potato production takes place in Turkey. Prior to primary data analysis, secondary data retrieved from FAO, and Turkish Statistical Institute were used to evaluate the general situation. The study focused on analysis of consumer behaviors of potato consumers in Turkey to analyses and evaluate potato consumption. The expected multiplier effect of the study was to foresee future potato consumption departing from a developing country example.

The sampling method utilised was selected respecting the limited information availability on the product or service and target audience, and the method is mostly preferred for consumer and market research. Accordingly, data of 3,072 consumers inhabited in urban districts of Niğde, Nevşehir, İzmir, Afyonkarahisar, Konya, Aksaray, Adana and Kayseri provinces of Turkey was retrieved via face-to-face survey between August and September 2020.

Different samples are preferred and implemented due to population size, tolerance level, confidence, and variance levels in scientific research. Especially for samples where information on the population is limited, the following sampling formula is used. It was presumed that 50% of total households consume potato with ±0.05 margin of error and provincial sample size was calculated as 384 for every province. Therefore, total 3,072 households were surveyed in 3072.

$$n = z^2\left[(p^*q)/d^2\right] = 1.96^2\left[(0.50^*0.50)/0.05^2\right] = 384^*7\,provinces = 3072$$

where z: 1.96 (Z value for 95% confidence interval), p: Share of the population that holds the targeted speciality q: (1 − p) Share of the population that does not hold the targeted speciality d: Accepted margin of error. ±5% for this research.

The data were evaluated via descriptive statistics, and multivariate analysis technique of Factor Analysis was implemented to detect the relevant factors. It is important to detect common sensitivity of the target consumer market in development of effective policy and marketing strategies. Accordingly, the qualitative features that affect potato consumption nation-wide were determined with Factor analysis. Micro level consumer related variables and demographic, economic, social, political-legal, technological and environment-related macro variables were questioned hypothesizing positive-negative impacts on fresh potato consumption. Marketing mix elements were used in product level analysis.

Factor analysis is a multivariate statistical tool used summarise the relationships between variables in order to enable policy-level inferences. The method aims to undermine the reason of bilateral dependency. The data matrix cannot be divided into criterion and estimation variable submatrices prior to the analyses and the relationships between variables are assumed to be linear. This behavioural approach is being widely used in marketing research as marketing problems are much more related to behavioural responses when compared with earlier. Accordingly, factor analysis is being used to understand consumer tendencies, preferences and behaviors in the scope or marketing policy making (Kurtuluş, 1998). The method, which is called as

data reduction technique, embraces determination of number of factors and evaluation of the factors. The columns represent relevant variables and lines represent the observations within the matrix at the onset (Ness, 2002).

Factor Analysis Data Matrix.

	Variables					
Case	X1	X2	X3			Xp
1	x_{11}	x_{12}	X_{13}	.	.	x_{1p}
2	x_{21}	x_{22}	X_{23}	.	.	x_{2p}
3	x_{31}	x_{32}	x_{33}	.	.	x_{3p}
n	x_{n1}	x_{n2}	x_{n3}	.	.	x_{np}

The mathematical model [31];

$$x_1 = b_{11}f_1 + b_{12}f_2 + \ldots. + b_{1k}f_k + u_1$$
$$x_2 = b_{21}f_1 + b_{22}f_2 + \ldots. + b_{2k}f_k + u_2$$
$$x_p = b_{p1}f_1 + b_{p2}f_2 + \ldots. + b_{pk}f_k + u_p$$

where; f_k = *general factors (factor importance/load of factor k in measuring variable p)*b_{pk} = *factor loads (degree of correlation between variable p and factor k)*u_p = *unique factor (variation resources that cannot be explained by the factors)*

The suitability of explanatory variables is measured with Kaiser–Meyer–Olkin (KMO) statistic. KMO is used to compare sample adequacy and observed and partial correlation coefficients. The analysis becomes less suitable as the KMO diminishes. The statistic cannot be accepted below 0.5 and above 0.5 is considered as inferable and above 0.8 is preferred (Emeksiz et al., 2002; Hair et al., 1992). In deciding number of factors, eigenvalues, scree test and variance criterion are used, and factors with eigenvalues above 1 should be preferred.

Results

With rising income, food consumption involves considerations regarding health and environmental consciousness, quality and label declaration that will refer to rising social status as well. On the contrary, reaching absolute saturation becomes the main objective of the consumer. The expenditure on total food, FFVs (fresh fruit and vegetables) and potato purchases were demonstrated in Table 1. Accordingly, gross food expenditure appeared as 1369.86 TL, while FFVs spending was 508.03 TL and spending on potato was 42.39 TL on average. The shares within total expenditures on the other hand was 22.58%, 8.38% and 0.70%, respectively, for food, FFVs and potato. The expenditure for potato and the attached potato amount refers to household-level fresh potato purchases. Checking out the national average food expenditure share of 20%, the findings seem to be appropriate. Yet, household-level potato expenditures differ due to price fluctuations when other factors were taken as fixed.

The fluctuations in demand and expenditure and price of potato need to be evaluated in general. Therefore, potato consumer prices were evaluated seasonally within this study. The real prices were calculated in order to purify effect of the inflation and nominal prices were converted to real takin 2003 Consumer Price Index as the base. The trends of calculated real prices were assessed with simple mean value, season indices and variation coefficients. With simple mean value (Alpar, 2011), for 2003–2020, the seasonal index inferred that the highest price paid for potato by consumers was 0.674 per kg and observed in May. The variation coefficient was 28.709 for this month and seasonal index was 116. The second month proposing highest prices was April with 0.651 TL. In general, consumers seemed to pay more than average for potato purchases in June, March, July and February months.

Annual and seasonal potato price fluctuation is being observed in other potato producing countries as well. For Germany, February price was lowest (0.365 $/kg) followed by March (0.488 $/kg) and April (0.492 $/kg) and highest in July (0.63 $/kg) with 118.68% seasonal index value. The lowest consumer price was observed in October (0.320 $/kg) followed by November (0.320 $/kg) and December (0.340 $/kg) in Russian Federation. The highest price was on July (0.530 $/kg). In the UK, lowest consumer price was recorded in May (0.64 $/kg), June (0.67 $/kg), April (0.75 $/kg) months, and the highest prices were observed in January (1.0 $/kg), November (0.99 $/kg), August (0.96 $/kg), months. Seasonal index was detected as 118.23% in January (Ahmed & Mohamed 2020). The fluctuations for the USA revealed highest prices in July and August and lowest prices in March and April as demonstrated in Table 2.

Table 1. Household income and expenditures.

Income/expenditure	TL*
Food expenditure	1369.86
FFVs expenditure	508.03
Potato expenditure	42.39
Total expenditure	4409.83
Household income	6065.47
	(%)
Food expenditure	22.58
FFVs expenditure	8.38
Potato expenditure	0.70
Total expenditure	72.70
Household income	100.00

N = 3072; *1$=7,43 TL.

Table 2. Monthly seasonal index for potato consumers.

Turkey-TR	Average real price (TL/kg)	Standard error	Variation coefficient	Seasonal index (%)
January	0.577	0.208	36.106	99.606
February	0.588	0.208	35.351	101.515
March	0.603	0.228	37.864	104.175
April	0.651	0.288	44.164	112.394
May	0.671	0.193	28.709	115.907
June	0.641	0.176	27.514	110.644
July	0.598	0.165	27.655	103.166
August	0.538	0.213	39.595	92.875
September	0.506	0.094	18.638	87.359
October	0.509	0.104	20.378	87.828
November	0.524	0.120	22.900	90.488
December	0.545	0.129	23.671	94.042
The USA – city centre White Potato	Average real price (TL/kg)	Standard error	Variation coefficient	Seasonal index (%)
January	1.539	0.137	8.895	98.866
February	1.533	0.126	8.199	98.441
March	1.511	0.123	8.144	97.042
April	1.517	0.110	7.220	97.424
May	1.572	0.142	9.048	100.965
June	1.565	0.136	8.715	100.554
July	1.611	0.127	7.868	103.471
August	1.628	0.136	8.365	104.561
September	1.595	0.121	7.584	102.466
October	1.563	0.128	8.185	100.426
November	1.529	0.111	7.281	98.203
December	1.519	0.118	7.746	97.580

NASS (2021).

Potato is considered as an inferior product due to general price trend and its demand's low price and income elasticity. As unit price of potato is lower in comparison with other fresh vegetables, it can easily be concluded as a low consumer sensitivity towards potato price fluctuations. Consumers' preference towards the amount of potato also does not vary considerably with changing income as well. However, rising income shifts consumers' interest to processed potato more and out-of-home consumption in café or restaurants. On the contrary, in-home fresh potato consumption tendency rises with declining income accompanied with declining demand for processed potato. Departing from this aggregate information, the impacts of varying prices on consumers' potato consumption preferences were searched within this study as well. When cost interpretation of consumers was overviewed, it can be noted that 35% of the target audience seem to respond negatively to rising prices in a direct way. Besides, the impact is indirect on 29% and there appeared no changing preference for 36% of the sample. Accordingly, the declination effect of rising potato prices could be observed among two thirds of the audience, even though potato is considered as a compulsory good.

As behavioural aspects have become more prevalent in sales and consumption decisions, qualitative factors direct more attention with regards to potato consumption. Accordingly, qualitative factors affecting potato consumption were studied within this research and 73 variables that can be related to consumption were used within factor analysis. Variables that can be related to more than one factor and variables that are not in line with the analytical expectations due to factor loads were removed from the analysis. The variables concerned were demonstrated in the below table respecting their descriptive statistics. All variables are ranked (Table 3).

Likert scale (1 – not at all important, 2 – not important, 3 – somewhat, 4 – important, 5 – very important) As indicated earlier, factors with eigenvalue above 1 were selected in determination of main number of factors (Figure 1). Accordingly, 19 variables were found out to be statistically related to potato consumption respecting their factor loads. Factor loads of all variables were detected with Varimax Rotation and variables with minimum 0.50 factor load were correlated with explanatory variables. After this elimination, the pre-determined three factors were described in relation to variables and the effects of each factor on potato consumption and consumer preferences were evaluated respecting factor loads.

The level of factor analysis applicability is highly appreciated with a 0.90 mean value of Kaiser-Meyer-Olkin (KMO) test statistic (Table 4). Thus, with rising KMO, the applicability and interpretation power of factor analysis rises.

The initial factor analysis results were demonstrated in Table 5. Accordingly, variables effective in potato consumption were related to three factors respecting eigenvalues, variance, and additive variance statistics. These three explanatory factors explained 65.30% of the total variance. Respective factor contributions to total variance were 36.45%, 14.77% and 13.39%.

Besides, the reliability of factors was checked as well (Table 6). The Cronbach's Alpha values of relevant factors were calculated as 95%, 80% and 81%, consecutively. These values confirmed reliability of the factors.

Findings of factor analysis made with Varimax rotation and variables related to factors were explained in Table 7 with their factor loads.

The first factor appeared was named as 'Consumer Awareness'. The factor demonstrated the importance of potato content in vitamins and minerals, nutrition value of these vitamins and minerals and their health effects for consumers and explained 36.15% of the total variance. Consumer awareness is the ability of the consumer to understand and pre-empt importance of a good/service to him/her. Awareness as a

Table 3. Descriptive statistics of the variables.

Variable	Explanation	Mean*	Standard deviation	Standard error
s46_potassium	Rich in potassium content	4.50	0.02	1.31
s46_folate	Includes folate, calcium, ferrous and magnesium	4.56	0.02	1.33
s46_ACK	Includes A, C, K, B6 and E vitamins	4.51	0.02	1.32
s46_digestion	Beneficial for digestion	4.30	0.02	1.31
s46_rich m&v	I rich in minerals and vitamins	4.24	0.02	1.25
s46_toxic	Helps expelling toxic materials	4.53	0.03	1.39
s46_death cell	Removes death cells and lead skin vitality	4.40	0.03	1.46
s46_bowel	Protects intestinal health and prevents constipation and spelling.	4.26	0.02	1.34
s46_skin	Good for skin health	4.15	0.03	1.51
s46_cell	Beneficial for stress management with vitamin and mineral content	4.31	0.03	1.51
s42_variety	Level of satisfaction from potato variety	3.16	0.02	1.05
s42_smell	Level of satisfaction from potato smell	3.22	0.02	1.09
s42_presentation	Level of satisfaction from potato presentation	3.16	0.02	1.14
s42_shape	Level of satisfaction from potato shape	3.72	0.02	0.97
s42_freshness	Level of satisfaction from potato freshness	3.73	0.02	0.99
s37_weight	Importance level of potato weight in purchasing decision	3.27	0.02	1.01
s37_size	Importance level of potato size in purchasing decision	3.42	0.02	0.99
s37_ physical appearance	Importance level of general potato appearance in purchasing decision	3.43	0.02	1.00
s37_selection	Importance level of sales venue in purchasing decision	3.55	0.02	1.01

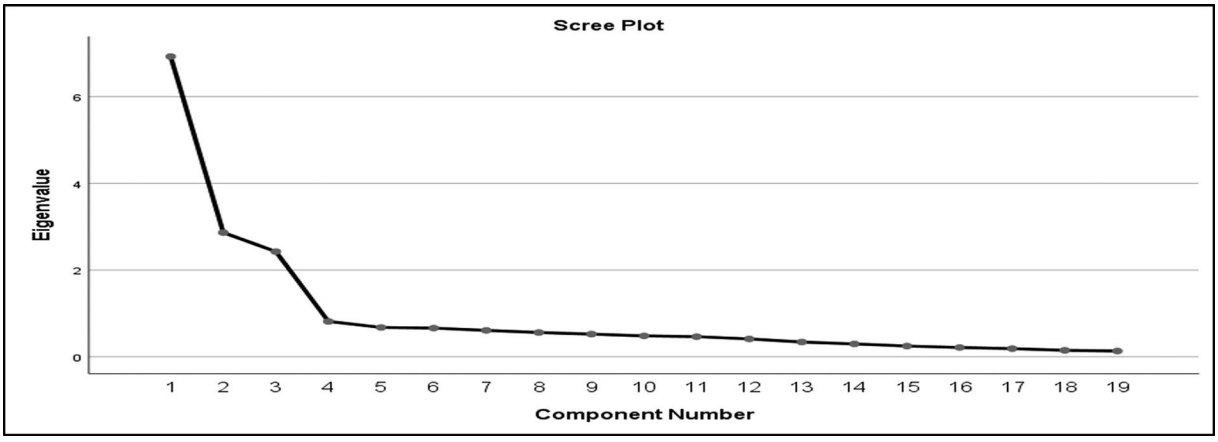


Figure 1. Eigenvalues of factors affecting potato consumption (Scree plot).

Table 4. KMO and Bartlett's tests.

Kaiser–Meyer–Olkin measure of sampling adequacy		0.90
Bartlett's test of sphericity	Approx. Chi-Square	36874.33
	df	171.00
	Sig.	0.00

Table 5. Statistical findings of initial factor analysis.

	Total variance explained								
	Initial Eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
Factors	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)
Factor 1	6.93	36.45	36.45	6.93	36.45	36.45	6.87	36.15	36.15
Factor 2	2.87	15.08	51.53	2.87	15.08	51.53	2.81	14.77	50.91
Factor3	2.43	12.77	64.30	2.43	12.77	64.30	2.54	13.39	64.30

Table 6. Factor reliability results.

Factors	Cronbach's alpha	Cronbach's alpha based on standardized items	No. of items
Factor 1	0.95	0.95	10.00
Factor 2	0.80	0.80	5.00
Factor 3	0.81	0.81	4.00

concept related to consumption refers to having complete information on benefits and harms/costs of a purchased or consumed product. Social variations between consumption pattern and health consciousness are on the agenda. When the case is overviewed for potato, the well-known false can be effective in

Table 7. Factor analysis rotation findings.

	Component		
Variables	1	2	3
s46_potassium	0.85		
s46_folate	0.85		
s46_ACK	0.84		
s46_digestion	0.84		
s46_rich m&v	0.83		
s46_toxic	0.83		
s46_death cell	0.83		
s46_bowel	0.83		
s46_skin	0.79		
s46_cell	0.78		
s42_variety		0.79	
s42_smell		0.76	
s42_presentation		0.74	
s42_shape		0.72	
s42_freshness		0.72	
s37_weight			0.84
s37_size			0.83
s37_physical appearance			0.75
s37_selection			0.75
Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization.[a]			

[a]Rotation converged in four iterations.

consumption level of the product. In developing countries, where consumer awareness has not been developed completely, nutritive value or health benefits can be disregarded when compared to taste preference. This situation may pose barriers in fresh potato consumption accompanied with under valuation of potato varieties or tendency to consume potato in processed form. In meeting health consciousness trend, well information of consumers in product specialities and public information on raising awareness will be required. The importance of consumer's health consciousness and awareness for development of potato consumption in the domestic market was recognised within the analysis.

The second factor effective was named as 'Consumer Value'. This second factor that explains 14.77% of the variation was found out to be related with variety, freshness, and smell of the product. The demonstration venue and potato's shape were also effective. The detected variables indicated that variety preference on the production level, sales venue, and visual demonstration decisions on marketing level affect potato consumption decision positively in line with rising consumer satisfaction. In sum, there marketing mix components should be planned in accordance with needs and expectations of the market itself. In this level, marketing services and quality features of the product appear as factors affecting potato consumption. When impossibility of 100% consumer satisfaction is accepted, consumer-oriented marketing implementations are expected to lead higher consumer satisfaction. Declining consumer satisfaction would lead declining potato consumption and vice versa as expected. Yet, consumer satisfaction is determinative in purchasing decision, amount to be purchased, purchasing venue and brand preference and repeated purchases. The second effective factor of consumer satisfaction infer information on social expectations for potato and preferential features regarding potato supplies. The level of satisfaction is important in revision of production, marketing and sales decisions and planning for marketing infrastructure and superstructure investments. Therefore, potato consumption trends will be affecting contemporary and future potato production and marketing decisions.

The accompanied third factor was named as 'Consumer Convenience' that explains 13.39% of the variation. Any sort of market expectation brings target market direction to the agenda. The factor determined for potato is compatible with the contemporary marketing mentality that focuses on similarities of the market rather than differences. Market segmentation is being considered in the scope of target market direction. Market segmentation refers to division of the heterogeneous domestic market among consumers having similar properties and determination of the most appropriate consumer segment that the specific (labelled or unlabelled) product should be promoted. Segmentation of purchasers in the market leads consideration of differences in the product, product characteristic and marketing strategies. Consumer market evaluation becomes prevalent in meeting personal or family level needs of the target market. Geographical, demographical, psychological, and behavioural criteria are used in market segmentation. These criteria are also valid in domestic-external market orientation and measurement of marketing success. With proper segmentation, strategic planning for product, price, place, promotion would be successful in. For potato case, segmentation would be specific to fresh and processed potato and would determine production and consumption amount and market price. The shape–size–weight criterion of factor 3 were found out to be related to product's quality characteristics and considered to be the results of product's seasonality and reminds importance of classification services. Potato, which is being consumed throughout the year, meets the consumer labelled as either old or new season product as it can be stored easily. The variation in shape–size–weight criterion for old and new potato poses an additional effect on decisions on potato purchases and consumption in accordance with seasonality. The interesting finding retrieved within the analysis is such that only one characteristic, size (bigger potato)

leads rising or declining effects on the amount purchased.

Discussion

Factors affecting consumer behaviour can be explained as social, psychological and personal factors. Personal factors are also considered in two dimensions as demographic and situational factors. Therefore, these variables should be taken into consideration when evaluating consumer and consumption behaviour towards agricultural products. Among agricultural products, potato is a product that appeals to all income groups due to its many uses and forms. In the literature in the field, Sanusi and Babatunde (2017) stated that the age of the household head, total monthly income, the price of potato and the price of the substitute product are the determinants of potato consumption. Wood et al. (2017) examined potato consumption from a health perspective and argued that the main reason for the decline in potato consumption among Australian consumers is that 'potatoes are high in carbohydrates' and 'starchy vegetables are not healthy.' Gustavsen (2021) examined table potato consumption by consumption frequency and found that consumption frequency is higher in older cohorts than in younger cohorts and decreases over the life cycle, and that to learn more about the decline in potato consumption frequency, the effects of economic factors such as prices and income; the effects of age, cohort and period; the effects of socioeconomic factors such as education, marital status and gender should be investigated, and that overall consumption frequency is expected to decline in later years due to higher consumption frequency in older cohorts than in younger cohorts. Wandel et al. (2001) found a decline in potato consumption in Norway between 1976 and 1997. They examined the reasons for this decline and found that 60%–70% of this decline in potato consumption was compensated by alternative staple foods, while the remaining 30%–40% was met by convenience foods such as pizza, hamburgers, rice, porridge and omelettes. In the same study, he noted that potato's notoriety for not fitting into low-carbohydrate diets and being associated with obesity, diabetes and cardiovascular disease further increased its notoriety and therefore consumption decreased. In addition, Ek et al. (2014) and Muraki et al. (2016) also linked potatoes with weight gain and risk of type 2 diabetes. However, Linde et al. (2006) found that potato consumption was not associated with obesity, while Attah et al. (2017) found that diabetes, overweight and obesity were associated with low potato consumption. Borch et al. (2016) conducted a systematic review of existing observational studies linking potatoes with obesity, diabetes and cardiovascular disease. They concluded that there was no evidence of an association between potato consumption and obesity or diabetes 2. McCracken and Marotz (1989) argued that several factors have contributed to the increased consumption of processed potatoes. The first factor is the increase in the participation of married women in the paid labour force and their partial or complete preference for convenience foods. However, changes in consumer demographics, socioeconomic conditions, lifestyles and new changes in food tastes may lead to a shift in processed potato consumption towards fresh produce. It was also emphasized that today's consumers have more knowledge about health and nutrition and demand more convenience, quality, value, variety and nutrition compared to previous years. McCracken and Marotz (1989) aimed to determine how consumers' demographic characteristics, lifestyles, nutrition and health concerns affect their potato purchasing decisions and consumption. They found three factors to achieve this goal. These factors are; today's consumers are interested in what they eat and are aware of additives and preservatives in their food, the second factor is consumers' evaluation of the nutritional properties of potatoes, and the third factor is not to identify the consumers who are most interested in the convenience aspects of foods.

Potato has been regarded as a fundamental food product. Rising population and income, direction to processed food, variation in consumption preferences, out of home consumption and changing consumer attitudes brought changes in potato demand and its usage fields. Potato has been considered as the food of future considering its household use, position as a main product or ingredient in food industry, services providers as restaurants etc. and tourism.

The factors affecting potato purchases for personal, or household level consumption can be named under three categories as economic, social, and psychological. Economic factors are directly related to price of the product respecting its varieties and income. Besides price and income expectations also are effective. Social and cultural specialities are considered within social factors and motivation, perceptions, attitudes and believes constitute social factors that affect demand and purchasing behaviors. In industrial markets where rational purchasing behaviors are widespread, technical, and qualitative

features of the products or situation of the product, company, brand become important. While potato is used as a fiscal good in consumer market, it is being considered as a main ingredient or a side product in the industrial market.

Determination of factors affecting perceptions, behaviors, needs and tendencies of a target audience and quantitative and qualitative analysis and estimation of market demand are essential to maintain supply-demand conformity. These sorts of evaluations are also essential in assurance and development of consumer awareness. When the relationship between nutrition and health expenditures is considered, the determination of relevant factors is also important to propose and modify public policies regarding social marketing and healthy consumption. In line with these expectations, the factors affecting potato consumption in Turkey domestic market sample were surveyed. In addition, the amount of potato consumption, price response and expenditure structure of households were analysed residing on some specific criteria.

The factors detected are related to household level potato consumption. While share of potato expenditure within household food expenditures is low as 3%, the downsizing effect pf rising consumer prices on households' consumption is significant. On the other hand, one third of the domestic market is not sensitive at all for potato price fluctuations. Yet, annual supply fluctuations and attached seasonal price variation of potato bring challenges in consumer demand. The qualitative factors, not attached with price and income, effective in domestic potato consumption appeared as consumer awareness, consumer satisfaction and consumer availability. These factors are in conformity with the modern marketing approaches. Thus, contemporary market management and sustainability of the market requires determination of needs and wants of their market properly and meeting those with high consumer satisfaction.

Consumer awareness on potato consumption is related to correct and incorrect perception and attitudes. Accordingly, the society needs to be informed by the public advertisement regarding nutrition content of potato and its positive health impacts. In addition, consideration of factors affecting consumer demand for potato in the essence of consumer value and consumer acceptance is essential in the pre-production, production, and post-production processes to assure supply-demand compatibility. As well known, consumers' request to purchase potato via direct selection is a result of inadequate marketing operations. This preferential situation is also not compatible with the consumer acceptance factor, and it reveals a problem. Consumer acceptance is important in the declaration of consumer expectations and production and distribution processes need to be developed according to this factor. With new studies, the factors affecting potato demand of industrial market or services sectors can be analysed. Thus, focusing on factors affecting sales and consumption of a specific product are essential to assure sustainability of society's health and estimation of market demand.

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