An Analysis of Consumers Awareness and Their Purchasing Behavior for Adulterated Rice-Grains in Nepal

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Nepalese consumers are becoming the victims of food adulteration these days so we have made an attempt to study the buying behavior of general consumers related to rice grains adulteration by conducting a primary level survey through distributing structured questionnaire among 207 consumers in Kathmandu Valley. The study tested the effect of demographic variables and other input factors such as; price perceptions, knowledge, attitudes, beliefs, and experiences that influence on purchase decision for the rice grains. It has also considered that the buying behavior of socially conscious consumers depend on their knowledge, attitude, beliefs, awareness and consciousness of the consumers. From the analysis, we conclude that consumers prefer local brands over foreign and unbranded items. Quality is perceived on the basis of specific standards of cleanliness, soundness and purity. Consumers identify adulterants by looking at the attributes of the rice grains before and after cooking. The study also reveals that legal awareness among the general consumers is really low. Many of them only check price, manufacturing date, and expiry date and ignore other important information in the packages. Finally, the outcome of the study has a significant relationship of price perceptions with age and family modes, knowledge on adulteration issues with education and monthly family income, and buying practices with the awareness, attitudes, and beliefs. Furthermore, we believe that this study will help different stakeholders in identifying the awareness level, and understanding the buying practices of the consumers. It is even useful for the policy makers and micro-economists to measure the consumer's welfare level. In order to increase the social welfare, consumer's surplus needs to be increased and this can only happen if the benevolent regulator takes initiation in imposing the minimum quality standards of rice grains ,and other concerned authorities should adopt certain action in order to minimize adulteration level.

Keywords: Purchasing behavior, adulterated foodstuffs, primary data and descriptive statistics

JEL Classification: D10, D12 and L66

1. Introduction

Food adulteration is one of the most prevalent social problems that are evident in our community as well as our country. Food adulteration causes health hazards to people which are not apparent in the initial stages but it has a devastating effect on the health of the people which becomes apparent in the long run. Rice, on the other hand is the principal food crops of the consumers of our country. Adulteration is one of the major problems we find in our rice grains, so we can imagine the harmful consequences we have to face by consuming such foodstuffs.

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In the fiscal year 2013-14, Department of Food Technology and Quality Control (DFTQC) of Nepal had filed the highest number of cases against the manufacturers and sellers of cereals and legumes along with their products as it were found to be the most unhygienic food products sold in the market. Then, we realized that adulterations in rice grains are common in Nepal in the form of mixing stones and sand in rice grains, mixing of good grade of rice grains with bad grade of rice grains and also through worst form of polishing and excessive coloring. So, we made an attempt in pursuing this study to identify whether people are aware of these types of adulteration, how they make decisions in purchasing rice grains, different factors that are making consumers purchase adulterated rice grains. Particularly, this study answered about what is the extent of consumer's awareness, attitudes, beliefs and behavior on food adulteration and what type of buying practices are followed by the consumers in purchasing rice grains. It identifies the factors that are responsible to increase food adulteration in Nepal. It examined the effect of demographic variables, price perceptions, knowledge, attitudes, beliefs, experiences to influence the purchasing behavior for food grains; and to measure the extent of awareness related to food adulteration, misbranding and legal terminologies among the consumers in Kathmandu Valley. This study will help different stakeholders to identify the awareness level of consumers towards adulteration. It is beneficial for the policy makers as well as the government to carry out various actions and also to increase social welfare.

Despite the facts that the brand investigation and the adulteration rate of various reputed brands are kept confidential by the concerned departments, it covers adulteration in rice grains because detection can be done by the consumers themselves by seeing the external features of the grains. Other foodstuffs that are adulterated are not a part of the study because it is difficult for the consumers to detect adulterants in such foodstuffs. The detection can be done by using standard lab testing procedure which is out of the scope of this study. This study is conducted only in Kathmandu valley though the prevalence of such malpractices is more evident in the rural areas and the consumers in the rural areas are highly exploited by the sellers. The outcomes of this research shows the purchasing behavior of rice grains followed by consumers of different age groups, gender, marital status, family mode, educational levels and family income. Consumer's awareness on food adulteration and the legal awareness on consumer's laws and rights, and legal terminologies are also found out.

The paper is organized as follows; the second section deals with the literature review, and third section shows the methodology of the study, the fourth section consists with discussion of the findings, and the fifth section makes the concluding remarks.

2. Literature Review

Some researches such as Badiger (1994) made an attempt to check the awareness regarding food adulteration among the rural and urban housewives and it was found that majority of the women were aware that the food they consumed was adulterated. But, most of the housewives were not aware about the health hazards caused due to adulterated foodstuffs. Unusan (2005) found that there was no significant relationship between respondents' demographic profile and food safety behaviors. Regarding food safety knowledge it was found that almost everyone indicated familiarity with the term food borne illness (97%). Kishtwaria et. al. (2006) conducted a survey to assess the awareness of respondents towards consumer terminology and their legal

rights. They found that majority of respondents were aware about the legal laws protecting the consumers against adulteration of food stuffs, adulteration of drugs; short weighing; false weights and measures; using stones for weights; using handmade balance and using deceitful packaging. Gupta and Panchal (2009) identified popularly used brands, studied buying practices of homemakers, and measured the extent of awareness related to food adulteration among homemakers. They concluded that low income group respondents were least educated, had low awareness about their rights and responsibilities and food adulteration. Abidfaheem et. al (2011) made a study keeping the major objective to assess the knowledge on food adulteration among families, detect food adulteration in selected food items, and to find the association between the knowledge with selected variables. Through this study, they have concluded that the prevalence of adulteration among selected food items even though is low, adulteration is prevalent in village. This study found 60% of the sample population had average knowledge on food adulteration. They asserted that awareness of the public in relation to food adulteration should be ongoing especially to the general public with lower level of education. Khapre et. al (2011) found the prevalence of food adulteration, buying practices of selected food items and their awareness towards Food Adulteration Act. They further assessed the relationship between per-capita incomes, education of respondents, and food borne illnesses with magnitude of adulteration in each house-hold. They concluded that price was the important factor while buying the grocery and nutritional foodstuffs. Singh et. al (2012) made a study to find out the effect of demographic variables; to analyze the buying practice of different food items in term of choice of labeled mark, local verses branded, retailer verses supermarket; and also to find the extent of awareness of food adulteration in various items including spices (coriander red chili etc.) and milk items such as ghee and oil either through TV or other sources. They found that regardless of the age, income and religion all of the groups were well aware of food adulteration and educated people were less prone to the effect. Banerjee et. al (2013) also conducted a similarly type of study and found that women were aware about the adverse effect of convenience food on health. Its consumption might lead to obesity and cancer like diseases in all age group people. This awareness was raised due to TV, Internet, and Newspaper. Seo et. al (2014) has suggested about the increasing needs for nutrition education on the appropriate use of processed foods. Designing useful nutrition education requires a good understanding of factors which influence on processed foods consumption. Boddula et. al (2014) concluded that infestation and adulteration were perceived as the greater risks in cereals and pulses. It was realized that the participants recognized diarrhea as a symptom of food infestation or adulteration, this observation notably contradicts the findings of a nation-wide Knowledge, Attitudes, Beliefs and Practices (KABP) on food safety.
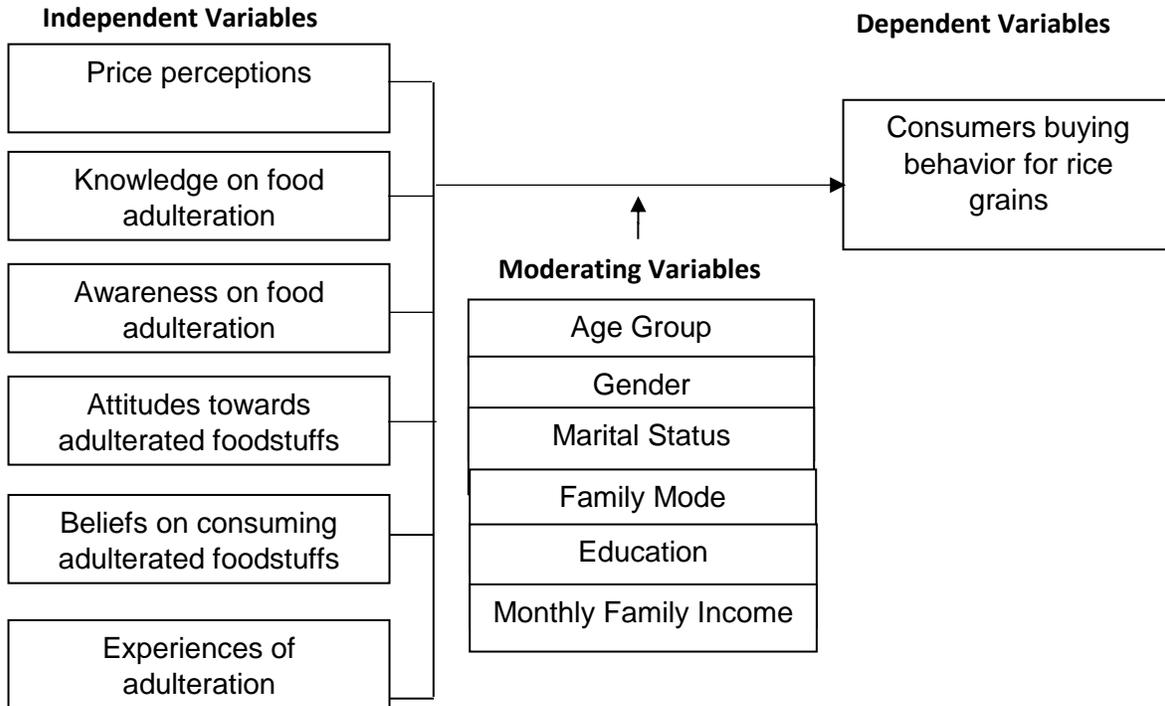
3. The Methodology and Model

3.1 The Basic Model

The conceptual framework that has been developed in Fig.No-1 is an extended model of Kaufmann et. al (2014). Since, purchase behavior also depends on factors such as price perceptions, buying practices and experience, these variables are incorporated in the present study. Marital status, family mode and education level is also added in the moderating variable as they also play the vital role of intervening variables in influencing consumers purchase behavior in Kathmandu Valley. It has attempted to address the purchase behavior of socially

conscious consumers of Kathmandu valley since rice is the principal food crops that are consumed by the people of main cities of our country.

Figure No. 1: Conceptualization of basic model

Independent Variables		Dependent Variables
Price perceptions		Consumers buying behavior for rice grains
Knowledge on food adulteration		
Awareness on food adulteration	**Moderating Variables**	
Attitudes towards adulterated foodstuffs	Age Group	
	Gender	
	Marital Status	
Beliefs on consuming adulterated foodstuffs	Family Mode	
	Education	
Experiences of adulteration	Monthly Family Income	

3.2 Specification of Variables

Dependent variables are the consumers buying behavior. It includes consumer's practices of buying from the trusted shops and buying only the trusted brands. Confidence in buying various brands also reflects buying practices. These are measured through Likert scale questions. The post purchase behavior of the consumers is measured through single response questions. These variables are affected by other moderating variables and independent variables**.**

Moderating variables include all the demographic variables. Age includes consumers ranging from 20 years of age to above 50 years of age. Gender includes male and female consumers. Marital Status includes the married, unmarried and single consumers. Educational Background includes consumers who have educational background of SLC or below, Intermediates, Bachelors and Masters Level. Mode of Family includes the consumers from joint families, nuclear families and also consumers who live independently. Monthly family income includes the income ranging from below Rs. 15000 to above 55000.All these demographic factors have helped to analyze the purchase behavior of adulterated rice grains.

Independent variables. The perceptions about price and quantity of adulterated foodstuffs have been identified through independent variables. Most of these attributes have been measured through Likert scale questions. The knowledge of consumers about adulteration and about

various laws and consumers terminologies have been quantified through both multiple choice questions and Likert scale questions. Experiences are measured by asking consumers about their prior experience of facing adulteration in rice grains through dichotomous questions.

3.3 The Data

The sample respondents represent those people who are responsible for purchasing rice grains for their household are from selected areas of Kathmandu Valley. The survey was conducted in November and December, 2014. The sample distribution is presented in the following table:

Table No.1: Research Sample by Age Group

Age group	No. of Respondents
20-30	56
31-40	47
41-50	53
Above 50	51
Total	207

The study has adopted non probability convenience sampling techniques and the questionnaires were distributed among 207 respondents in different areas of Kathmandu Valley. Pilot testing was done among 22 respondents (10% of the total sample size). Through this test, an impressive result was obtained. Frequent cross checking was done. In order to ensure reliability of the data, Cronbachs Alpha test score was also obtained which was found greater than 0.6, this ensures the reliability of the data. And then, the collected data has been logically and systematically entered using SPSS software and analysis has been done as per the requirement of the study. The details information about the demographic profile of the respondents is mentioned in the following table as follows;

Table No. 2: Demographic Profile of the Respondents

S. No.	Demographic Variables	No. of Respondents (207)	Percentage of Respondents (100%)
1.	**Age Group**		
	20-30	56	27.1%
	31-40	47	22.7%
	41-50	53	25.6%
	Above 50	51	24.6%
2.	**Gender**		
	Male	98	47.3%
	Female	109	52.7%
3.	**Marital Status**		
	Married	166	80.2%
	Unmarried	34	16.4%
	Single	7	3.4%
4.	**Mode of Family**		
	Joint	90	43.5%
	Nuclear	111	53.6%
	Independent	6	2.9%
5.	**Educational Background**	62	30%
	SLC or below	30	14.5%
	Intermediates	58	28%
	Bachelors	57	27.5%
	Masters		
6.	**Monthly Family Income (Rs)**		
	Below 15000	38	18.4%
	15000-25000	38	18.4%
	25001-35000	41	19.8%
	35001-45000	26	12.6%
	45001-55000	29	14%
	Above 55000	35	16.9%

Table No. 2 shows that out of 207 respondents, 27.1% belong to the age group of 20-30 which has the highest participants in survey and there is an interesting evidences that 52.7% of the respondent of the study are female and it is quite reliable because most of the female make purchase decision of rice in the survey area. Out of total respondents 80.2% of the respondents are married. The mode of family background is also important in our study in which we found that 53.6% of the respondents belong to nuclear family followed by 43.5% joint family. The highest number of respondents has an educational background of SLC or below. The data shows that 19.8% of the respondents have monthly income of Rs.25001-35000 which is the highest earning group in the study.

4. The Results

This study is based on qualitative and quantitative research in which descriptive statistics has been used for analyzing the entire data. Frequency, table charts and graphs are used for descriptive analysis whereas chi square test, F-test, ANOVA test and other needful testing have been done for inferential analysis. The detail elaborations of hypothesis testing are explained in the discussion section.

4.1 Descriptive Analysis

This section deals about the major determinants of the purchase decision of consumer on rice grains, and it has come up with the facts that has been faced by consumers on their brands preferences, quality perceptions, adulterations, evaluation of adulteration, awareness on food adulteration by medias, encountering legal terms for avoiding adulteration and the factors that have led to increase food adulteration on rice grains in Nepal. The figures in percentage are presented in the following tables from table No.3 to table No.19 systematically.

Table No. 3: Distribution based on problems faced by consumers in the market

S.N.	Problems Faced by consumers in the market	%of Respondents
1.	Adulteration of products	86.5%
2.	False weights and measures	41.1%
3.	Black Marketing	41.1%
4.	Misleading Advertisements	38.2%
5.	Sale of substandard products	31.4%

Table No.3 shows that majority of the consumers have faced adulteration of products in the market. Other malpractices are also faced by the consumers in the market. From the above table, we can infer that consumers are being the victims of malpractices of adulteration.

Table No. 4: Distribution on brands preference on purchasing the rice grains

S.N.	Brand Preferred	% of Respondents
1.	Local Brands	88.9%
2.	Foreign Brands	7.7%
3.	Unbranded	3.4%

Table No.4 shows that majority of the consumers prefer local brands over foreign brands and unbranded rice grains. Least number of consumers prefers foreign and unbranded items.

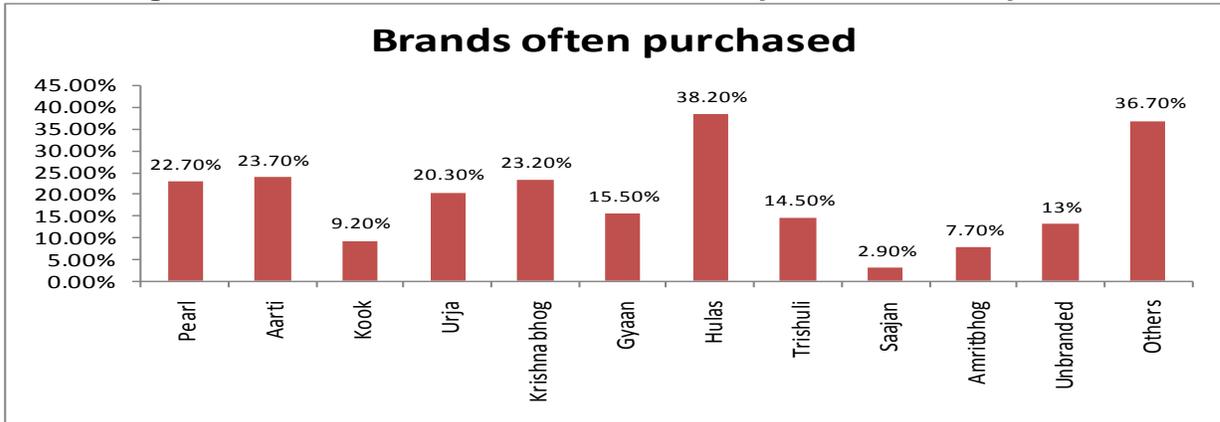**Figure No. 2: Distribution on brands often purchased in Nepal**

Figure No. 2 shows that Hulas (38.2%) is the most purchased brand. After Hulas, 36.7% of the respondents have given their own opinion for the brands they have purchased in which they have given diversified opinions on the brands purchased.

Table No. 5: Distribution of frequency of purchase of rice grains

S.N.	Frequency of purchase of rice grains	% of Respondents
1.	Monthly	74.4%
2.	Quarterly	23.2%
3.	Weekly	2.4%

Table No. 5 shows that the consumers generally like to make bulk purchase of rice grains and keep the stocks of rice grains since rice grains is consumed every day and consumers want to be free of the hassles of making the purchase of rice grains on a weekly or a daily basis.

Table No. 6: Distribution of stores preferred to purchase of rice grains

S.N.	Stores preferred to purchase rice grains	% of Respondents
1.	Stockiest/Wholesalers	54.6%
2.	Local Market/ Retailers	33.8%
3.	Supermarket	11.6%

Table No. 6 shows that majority of the respondents buy rice grains from the wholesalers. As mentioned earlier, we can see that the consumers like to make bulk purchases from the wholesalers. Wholesalers also give the facility to the consumers in form of discounts and they also provide loaders who deliver the sacks of rice grains to consumer's place.

Table No. 7: Distribution based on Quality Perceptions

S.N	Quality Perceptions	% of Respondents
1.	Specific standards of cleanliness, soundness and purity	62.3%
2.	Cooking, eating and processing quality	55.1%
3.	Nutritional Quality	32.9%%
4.	Milling Quality	14%

Table No. 7 shows that majority of the respondents perceive quality on the basis of specific standards of cleanliness, soundness and purity followed by cooking, eating and processing quality. It is really sad to see that least number of respondents perceive quality on the basis of nutritional and milling quality which is perhaps the most important attributes that the consumers need to consider from the quality perspective.

Table No. 8: Distribution based on adulteration faced in rice grains

S.N.	Adulteration faced in rice grains	% of Respondents
1.	Yes	75.8%
2.	No	24.2%

Table No. 8 shows that majority of the respondents have faced adulteration.

Table No. 9: Methods of identifying adulterants in rice grains

S.N.	Identifying adulterants in rice grains	% of Respondents
1.	Change in attributes of rice before and after cooking	51.7%
2.	Physical appearance	46.4%
3.	Touch or feel	43%%
4.	Aroma or smell	20.3%
5.	Other	4.9%

Table No. 9 shows that majority of the respondents identify adulterants by seeing the changes in attributes of rice grains before and after cooking. Some respondents have given their own opinion in which they have mentioned that biting the rice grains, examining the rice grains, eating or tasting, discussing with the other consumers, looking at the shapes, sizes of rice grains and also cleaning are some of the methods of identifying adulterants in rice grains.

Table No. 10: Distribution based on adulterants available in rice grains

S.N.	Adulterants available in rice grains	% of Respondents
1.	Stone or sand	70%
2.	Mixing bad grade grains with good grade grains	55.1%
3.	Pests, worms	46.4%
4.	Worst polishing and excessive coloring	45.9%
5.	Pesticides	5.8%

Table No. 10 shows that majority of the respondents identify stone or sand followed by mixing of bad grade grains with the good grade grains as the major adulterants in rice grains. From the above table, we can infer that those adulterants that can easily be assessed by the physical appearance are identified by the consumers whereas those attributes like worst polishing and pesticides that are difficult to be identified by physical appearance are not recognized by consumers.

Table No. 11: Distribution based on evaluation of adulteration in Nepalese Brands

S.N.	Evaluation of adulteration in Nepalese Brands	% of Respondents
1.	High level of adulteration	29%
2.	Medium level of adulteration	49.8%
3.	Low level of adulteration	21.3%

Table No.11 shows that majority of the consumers evaluate Nepalese rice brands as having medium level of adulteration.

Table No. 12: Distribution based on evaluation of adulteration in Foreign Brands

S.N.	Evaluation of adulteration in Foreign Brands	% of Respondents
1.	High level of adulteration	13.5%
2.	Medium level of adulteration	22.2%
3.	Low level of adulteration	64.3%

Table No. 12 shows that majority of the consumers evaluate Foreign rice brands as having low level of adulteration.

Table No. 13: Distribution based on evaluation of adulteration in unbranded rice

S.N.	Evaluation of adulteration in Unbranded rice	% of Respondents
1.	High level of adulteration	57.5%
2.	Medium level of adulteration	28%
3.	Low level of adulteration	14.5%

Table No. 13 shows that majority of the consumers evaluate unbranded rice grains as having high level of adulteration.

Table No. 14: Factors influencing purchase decision of rice grains

S.N.	Factors influencing purchase decision of rice grains	% of Respondents
1.	Taste	77.3%
2.	Quality	66.7%
3.	Price	52.7%
4.	Brand Image	32.4%
5.	Necessity	23.7%
6.	Accessibility	19.3%
7.	Packaging	13.5%
8.	Advertisement	10.6%
9.	Lack of good options	8.2%

The above facts have been presented in the following Fig.No.3 as follows;

Figure No. 3: Factors influencing purchase decision of rice grains in Nepal
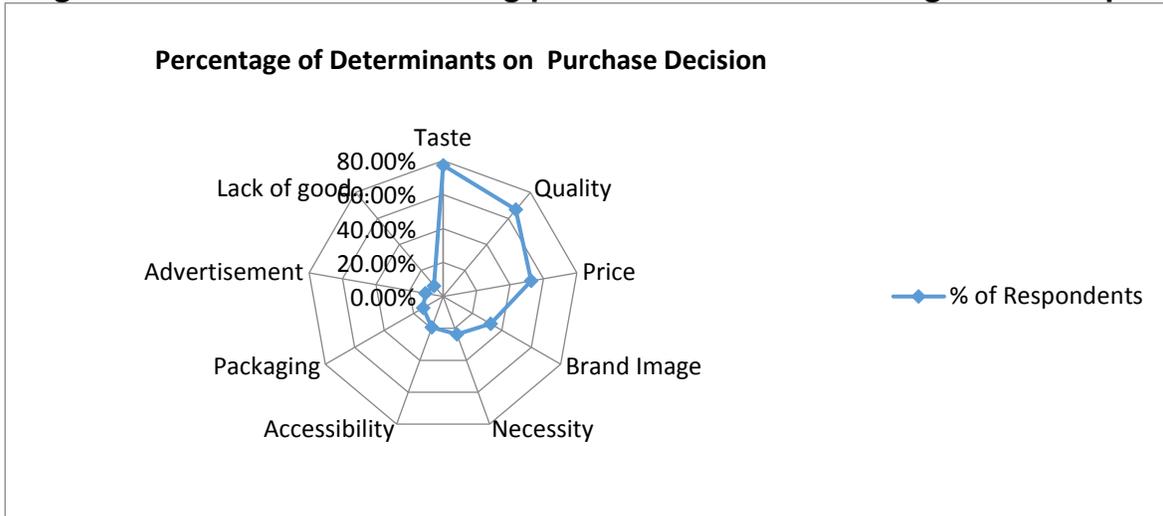

Figure No. 3 shows that majority of the consumers purchasing decisions of rice grains is influenced by taste followed by quality and price. In rice grains, factors such as brand image, packaging and advertisement does not play an important role to influence the purchase decision of rice grains.

Table No. 15: Post purchase behavior after finding adulteration

S.N.	Post purchase behavior after finding adulteration	% of Respondents
1.	Returned the food	36.2%
2.	Switched to other brands	22.7%
3.	Warning to the shopkeeper	19.8%
4.	Legal action	3.4%
5.	Just used the product	17.9%

Table No. 15 shows that most of the consumers have returned the food followed by switching to other brands, warning to the shopkeepers, just used the product without any complaint, and legal action. From the above table, we can infer that consumers are not taking adequate steps to keep themselves aware from the malpractices of food adulteration.

Table No. 16: Media raising awareness on food adulteration

S.N.	Media raising awareness on food adulteration	% of Respondents
1.	Television	77.3%
2.	Newspaper/ Magazines	66.7%
3.	Related consumers feelings and discussions	52.7%
4.	Internet	31.4%
5.	Radio	27.5%%
6.	Others	3.4%

Table No. 16 shows that majority of the consumers have mentioned television as the media raising awareness on food adulteration followed by newspaper/magazines and related consumers feelings and discussions. The media such as television, newspapers can be a very influential platform in order to raise awareness on adulteration as most of the consumers are exposed to these media.

Table No. 17: Behavior of checking information in the package

S.N.	Behavior of checking information in the package	% of Respondents
1.	Price, date of manufacturing and expiry	78.7%
2.	Name and address of manufacturing company	48.8%
3.	Composition, quantity and weights of products	28.5%
4.	Standard marks of certification given to the product	25.6%

Table No. 17 shows that majority of the consumers check price, date of manufacturing and expiry date of the product. From the table, we can infer that most of the consumers neglect other important information in the packages.

Table No. 18: Consumers encountering legal terms

S.N.	Consumers encountering legal terms	% of Respondents
1.	Advertisements and awareness on food adulteration	64.7%
2.	Consumer Rights	50.2%
3.	Certification marks such as NS (Nepal standard)	36.2%
4.	Consumers Protection Act	31.4%

Table No. 18 shows that majority of the consumers encounter advertisements and awareness on food adulteration followed by consumers rights. The legal awareness on Consumers

Protection Act and the certification marks such as NS and ISO is really low. Consumers need to be really aware about important legal concepts such as the laws formulated to protect them and quality certification marks such as Nepal Standards (NS) and ISO.

Table No. 19: Factors that have led to increase food adulteration in Nepal

S.N.	Factors that have led to increase in food adulteration in Nepal	% of Respondents
1.	Infrequent inspection from the concerned departments	78.7%
2.	Lack of punishment to adulterators	73.9%
3.	Consumers negligence towards such issues	54.1%
4.	Protection of businessmen from political leaders	47.3%
5.	Least provision of inspection for imported food	46.4%
6.	Others	4%

Table No. 19 shows that majority of the consumers feel that infrequent inspection from the concerned departments is the major factors that have led to increase in food adulteration in Nepal followed by lack of punishment to adulterators and consumers negligence towards such issues. Respondents have also given their own opinion in which they have mentioned that businessmen negligence, lack of consumers awareness, lack of government interventions in false advertisements, lack of strong laws, poor government role in marketing management, profit motive, unethical business practices and greedy nature of business persons are also some of the factors that have led to increase food adulteration in Nepal.

4.2 Test of Hypothesis

This section consists the discussion of the results through inferential analysis. Pearson's chi square test, independent sample t- test and correlation tests are done and the results have been obtained as follows.

H0$_1$: *There is no significant relationship between demographic variables and price perception.*

Table No. 20: Test of significance between demographic variables and price perceptions

Statements of Hypothesis	t value	P value	Remarks
Test of significance between age and perceptions of price on adulterated rice grains.	-	0.032	Significant
Test of significance between gender and perceptions of price on adulterated rice grains.	0.343	-	Insignificant
Test of significance between marital status and perceptions of price on adulterated rice grains.	-	0.051	Insignificant
Test of significance between family mode and perceptions of price on adulterated rice grains.	-	0.009	Significant
Test of significance between education and perceptions of price on adulterated rice grains.	-	0.708	Insignificant
Test of significance between monthly family income and perceptions of price on adulterated rice grains.	-	0.374	Insignificant

Table No. 20 shows that age and family mode have a significant level of relationship with perceptions of price on adulterated rice grains whereas the other demographic variables such as gender, marital status, education and monthly family income doesn't have any significant relationship with the perceptions of price on adulterated rice grains.

$H0_2$: *There is no significant relationship between demographic variables and knowledge on food adulteration issues.*

Table No. 21: Test on demographic variables and knowledge on food adulteration issues

HYPOTHESES	t value	P value	Remarks
Test of significance between age and knowledge on food adulteration issues.	-	0.675	Insignificant
Test of significance between gender and knowledge on food adulteration issues.	0.275	-	Insignificant
Test of significance between marital status and knowledge on food adulteration issues.	-	0.214	Insignificant
Test of significance between family mode and knowledge on food adulteration issues	-	0.785	Insignificant
Test of significance between education and knowledge on food adulteration issues.	-	0.001	Significant
Test of significance between monthly family income and knowledge on food adulteration issues.	-	0.023	Significant

Table No. 21 shows that education and monthly family income have a significant level of relationship with knowledge on food adulteration issues whereas the other demographic variables such as age, gender, marital status, and family mode doesn't have any significant relationship with knowledge on food adulteration issues.

H0$_3$: *There is no significant relationship between demographic variables and awareness on food adulteration issues.*

Table No. 22: Test on demographic variables and awareness on food adulteration issues

HYPOTHESES	t value	P value	Remarks
Test of significance between age and awareness on food adulteration.	-	0.476	Insignificant
Test of significance between gender and awareness on food adulteration.	0.006	-	Significant
Test of significance between marital status and awareness on food adulteration.	-	0.732	Insignificant
Test of significance between family mode and awareness on food adulteration.	-	0.031	Significant
Test of significance between education and awareness on food adulteration.	-	0	Significant
Test of significance between monthly family income and awareness on food adulteration.	-	0.204	Insignificant

Table No. 22 shows that gender, family mode and education have a significant relationship with the awareness on food adulteration whereas the other demographic variables such as age, marital status, and monthly family income don't have any significant relationship with awareness on food adulteration.

H0$_4$: *There is no significant relationship between demographic variables and attitudes related to adulterated foodstuffs.*

Table No. 23: Test on demographic variables and adulterated foodstuffs

HYPOTHESES	t value	P value	Remarks
Test of significance between age and attitudes related to adulterated foodstuffs.	-	0.539	Insignificant
Test of significance between gender and attitudes related to adulterated foodstuffs.	0.086	-	Insignificant
Test of significance between marital status and attitudes related to adulterated foodstuffs.	-	0.037	Significant
Test of significance between family modes and attitudes related to adulterated foodstuffs.	-	0.513	Insignificant
Test of significance between education and attitudes related to adulterated foodstuffs.	-	0.106	Insignificant
Test of significance between monthly family income and attitudes related to adulterated foodstuffs.	-	0.328	Insignificant

Table No. 23 shows that marital status has a significant level of relationship with the attitudes related to adulterated foodstuffs whereas the other demographic variables such as age, gender, family mode, education and monthly family income don't have any significant relationship with attitudes related to adulterated foodstuffs.

H0₅: *There is no significant relationship between demographic variables and beliefs on food adulteration.*

Table No. 24: Test on demographic variables and beliefs on food adulteration

HYPOTHESES	t value	P value	Remarks
Test of significance between age and beliefs on food adulteration.	-	0.159	Insignificant
Test of significance between gender and beliefs on food adulteration.	0.276	-	Insignificant
Test of significance between marital status and beliefs on food adulteration.	-	0.847	Insignificant
Test of significance between family modes and beliefs on food adulteration.	-	0.146	Insignificant
Test of significance between education and beliefs on food adulteration.	-	0.466	Insignificant

Table No. 24 shows that there is no significant relationship between demographic variables and beliefs on food adulteration.

H0₆: *There is no significant relationship between demographic variables and adulteration experiences.*

Table No. 25: Test on demographic variables and adulteration experiences

HYPOTHESES	t value	P value	Remarks
Test of significance between age and adulteration experiences.	-	0.381	Insignificant
Test of significance between gender and adulteration experiences	-	0.746	Insignificant
Test of significance between marital status and adulteration experiences.	-	0.501	Insignificant
Test of significance between family mode and adulteration experiences.	-	0.368	Insignificant
Test of significance between education and adulteration experiences.	-	0.479	Insignificant
Test of significance between monthly family income and adulteration experiences.	-	0.441	Insignificant

Table No. 25 shows that there is no significant relationship between demographic variables and adulteration experiences.

H0₇: *There is no significant relationship between demographic variables and buying practices.*

Table No. 26: Test of significance between demographic variables and buying practices

HYPOTHESES	t value	P value	Remarks
Test of significance between age and buying practices.	-	0.944	Insignificant
Test of significance between gender and buying practices.	0.556	-	Insignificant
Test of significance between marital status and buying practices.	-	0.015	Significant
Test of significance between family mode and buying practices.	-	0.755	Insignificant
Test of significance between education and buying practices.	-	0.048	Significant
Test of significance between monthly family income and buying practices.	-	0.669	Insignificant

Table No. 26 shows that marital status and education have a significant relationship with the buying practices whereas the other demographic variables such as age, gender, family mode, education and monthly family income doesn't have any form of significant relationship with the buying practices.

H0₈: *There are no significant relationship between all the independent variables (Price Perceptions, Knowledge, awareness, attitudes, and beliefs) and buying practices.*

Table No. 27: Test of significance between all the independent variables and buying practices

		Correlation				
		Price perception	Knowledge	Awareness	Attitudes	Beliefs
Buying Practices	Pearson Correlation	0.13	0.132	.158*	.202**	.267**
	Sig. (2-tailed)	0.061	0.058	0.023	0.004	0
	N	207	207	207	207	207

Table No. 27 shows that awareness, attitudes and beliefs have a significant level of relationship with the buying practices whereas buying practices don't have any form of significant relationship with the price perception and knowledge.

H0$_9$: *There is no significant relationship between experiences on adulteration and buying practices.*

Table No. 28: Test on experiences of adulteration and buying practices.

HYPOTHESES	t-value	P value	Remarks
Test of significance between experiences on adulteration and buying practices.	-	0.831	Insignificant

Table No. 28 shows that there is no significant relationship between experiences on adulteration and buying practices.

H0$_{10}$: *There is no significant relationship between demographic variables and post purchase behavior.*

Table No. 29: Test on demographic variables and post purchase behavior

HYPOTHESES	t value	P value	Remarks
Test of significance between age and post purchase behavior.	-	0.006	Significant
Test of significance between gender and post purchase behavior.	-	0.639	Insignificant
Test of significance between marital status and post purchase behavior.	-	0.043	Significant
Test of significance between family mode and post purchase behavior.	-	0.395	Insignificant
Test of significance between education and post purchase behavior.	-	0.001	Significant
Test of significance between monthly family income and post purchase behavior.	-	0.182	Insignificant

Table No. 29 shows that age, marital status and education have a significant level of relationship with the post purchase behavior whereas the other demographic variables such as gender, family mode, and monthly family income doesn't have any form of significant relationship with the post purchase behavior.

4.3 Comparative Analysis of Legal Awareness

Consumers of different age groups, gender and educational level differ on their level of awareness. So, a comparative analysis is done in order to ascertain the overall awareness and understand the extent of awareness among the respondents of different demographic variables (age group, gender and education).

Table No. 30: Comparative analysis on awareness level on Consumer Rights

High	Low
Age group: 20-30 and 41-50	Age Group: Above 50 years
Gender: Female Consumers	Gender: Male Consumers
Education: Masters	Education: SLC or below and Intermediates

Table No. 30 shows that an average number of respondents have awareness on Consumers Rights. The age group of 20-30 and 41-50, female consumers and consumers having the educational background of Masters have high level of awareness on Consumers Rights whereas the consumers belonging to the age group of above 50 years, male consumers and those having an educational background of SLC or below and intermediates level have low level of awareness on Consumers Rights. Since the awareness is not high, frequent awareness programs need to be carried out so that the consumers can be aware about the laws that protect their rights.

Table No. 31: Analysis on awareness level on Consumer Protection Act

Slightly High	Very Low
Age group: 31-40	Age Group: 20-30
Gender: Male Consumers	Gender: Female Consumers
Education: Bachelors	Education: SLC or below

Table No. 31 shows that the overall awareness on Consumers Protection Act is very low. The consumers belonging to the age group of above 20-30 years, female consumers and those having an educational background of SLC or below have very low level of awareness on Consumers Protection Act whereas the consumers belonging to the age group of 31-40, male consumers and consumers having the educational background of Bachelors have slightly high level of awareness on Consumers Protection Act. We can find those male consumers and those having higher educational degrees have slightly high level of awareness on Consumers Protection Act.

Table No. 32: Analysis on awareness on advertisements and programs on food adulteration

Very High	Slightly Low
Age group: 20-30, 31-40 and above 50	Age Group: 41-50
Gender: Female Consumers	Gender: Male Consumers
Education: SLC or below	Education: Bachelors and Masters

Table No. 32 shows that the overall awareness on advertisements and programs on food adulteration is very high. The age group of 20-30, 31-40, and above 50 years, female consumers and consumers having the educational background of SLC or below have very high level of awareness on advertisements and programs on food adulteration whereas the consumers belonging to the age group of above 41-50 years, male consumers and those having an educational background of bachelors and masters have slightly low level of awareness on advertisements and programs on food adulteration. We can infer that female consumers and those having a slightly lower educational background are more exposed to advertisements and programs on food adulteration.

Table No. 33: Comparative analysis on awareness on certification marks such as ISO and NS standards

Slightly High	Very Low
Age group: 20-30	Age Group: 41-50 and above 50 years
Gender: Female Consumers	Gender: Male Consumers
Education: Bachelors	Education: SLC Or below

Table No. 33 shows that the overall awareness on certification marks ISO and NS is very low. The consumers belonging to the age group of above 41-50 years and above 50 years, male consumers and those having an educational background of SLC or below have very low level of awareness on ISO and NS standards whereas consumers belonging to the age group of 20-30, female consumers and consumers having the educational background of bachelors have slightly high level of awareness on certification marks such as ISO and NS standards. From the above table, we can infer that young consumers, female consumers and those having a comparatively higher level of education have slightly high awareness. Elder consumers and those having low level of educational background have very low awareness. Since the overall awareness is really low, the awareness on ISO and NS should be raised through different mediums.

5. Summary and Conclusions

The study concludes that majority of the consumers have faced adulteration of rice products in the market of Kathmandu Valley. Local brands are the most preferred brands as compared to foreign and unbranded items. However, people evaluate foreign brands as the least adulterated brands as compared to others and unbranded as the most adulterated.

Hulas is the most purchased brand in study area by the consumers. Majority of the consumers purchase rice grains on a monthly basis and from wholesalers. In terms of quality perceptions,

majority of the consumers perceived quality on the basis of specific standards of cleanliness, soundness and purity. Majority of the consumers have experienced adulteration in rice grains and in order to identify adulterants in it, they find the difference in the attribute of the grains after or during cooking. Many of the consumers have agreed that stones or sands, and mixing bad grade grains with good grade grains were the most common adulterants found in rice grains.

Taste is the most important influencing factor affecting purchase of rice grains. After this people give priority to quality followed by price. People are not ready to compromise quality over price. In encountering legal terms, majority of the consumers have frequently encountered advertisement and programs related to awareness on food adulteration. The respondents have also encountered Consumer Rights. Least number of respondents has encountered certification marks such as NS and ISO and Consumers Protection Act. As the factors responsible to increase food adulteration in Nepal, majority of the consumers feel that infrequent inspection from the concerned departments, lack of punishment to adulterators, consumers negligence to such issues have led to increase in food adulteration in Nepal. Consumers have also given their own opinions on the factors that have led to increase in food adulteration in Nepal in which they have mentioned that businessmen negligence, lack of consumers awareness, lack of government interventions in false advertisements, lack of strong laws, poor government role in marketing management, profit motive, unethical business practice/greedy nature of businesspersons are also some of the factors that have led to increase in food adulteration in Nepal. It is also found that majority of the consumers check the price, date of manufacturing and date of expiry but ignore other important aspects in the packages. The study shows significant relationship of price perceptions with age and family modes, knowledge on adulteration issues with education and monthly family income, and buying practices with the awareness, attitudes, and beliefs.

Finally, it is concluded that consumers are becoming the victims of food adulteration. It can also be inferred that television and newspapers are the most important media contributing to raise the awareness related to adulteration. So, these media can be very useful in creating awareness programs on food adulteration. Hence, it is recommended that government should make time to time intervention in the market and make frequent inspections so that the adulterators are not able to carry out such malpractices. The future researches also can be carried in adulteration of other products such as oil, milk, wheat, petroleum oil, water etc. in rural and other urban areas of Nepal as well.

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