

Unraveling Consumer Decisions towards Animal Ingredients in Personal-care Items: The Case of Dhaka City Dwellers

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Abstract

With an ever-increasing, demanding population, the pressure on animals from corporations that produce animal-based products is on the rise. Although animal-based products are fast losing appeal in the developed world due to conscious consumer choices, the same cannot be witnessed in the less developed counterparts, like Bangladesh. This paper is, hence, an attempt to evaluate the level of awareness of Bangladesh's Dhaka city-dwellers regarding the animal-derived ingredients in their luxury consumer commodities, namely, cosmetics, toiletries and perfumes. Additionally, it aims to understand whether awareness levels are negatively proportional to the consumption of animal-based products or not. To do this, a mixed methodology was used to perform (1) an extensive literature review spanning both developed and developing country citizens, with special focus on Dhaka residents; (2) a survey on 315 consumers to understand their choices, awareness levels and the relationship between the two; and (3) a record-keeping of select animal-based luxury products from the a few local supermarkets. Next, graphical and statistical analyses were used to understand the significance of current attitude and awareness levels among varied genders and age groups. The finding that 61% of the respondents read the ingredients on the packaging of an animal-based luxury product before buying it and still did, shows a gap in knowledge and awareness. Furthermore, while attitude seemed to be insignificant in creating consciousness, heightened knowledge levels were found to be proportional to awareness levels about animal derivatives in goods. This implies that although, currently, the overall awareness level regarding the harm that the environment faces when too much of animal-based products are used is low amongst the sample, heightened consciousness will lead them to make environmentally conscious choices. For example, it was found that the middle-aged respondents had both higher levels of awareness and lower levels of consumption when it came to products containing animal derivatives, unlike their younger and older peers. General recommendations include raising awareness levels via private sector and government intervention, appreciating the challenges that this will bring about.

Keywords

Animal Derivatives, Consumer Behavior, Animal-based Products, Environmentally Friendly Cosmetics

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1. Introduction

Biodiversity plays a critical role in preserving the integrity and sustainability of ecosystem services and functions [1]. However, human domination of natural ecosystem due to burgeoning population and consumption levels has

threatened global biodiversity [2]. Ongoing disturbances of biological diversity can lead to complex and reverberating consequences on organisms and ecosystems, leaving species on the brink of extinction [2-4]. While demands for cosmetics and personal care products are increasing, it is also raising the sales growth of the ingredients used in these

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products [5, 6]. Consumers are becoming more aware of the inhumane treatment of animals used for production and the adverse environmental impacts that result from the disruption of biodiversity. With the emerging concept of sustainability being the driving force for any product category, there has been a mainstream phenomenon in contemporary consumer culture where the demand for natural and organic personal care products, coupled with ethical, environmental and sustainable source practices, are increasing [7, 8]. There can be other avenues through which the use of animal ingredients may be deemed undesirable by the consumers such as due to health concerns. However, consumers in the developing world are often unaware of the fact that cosmetics and personal care products may contain vast amounts of inputs of animal origin. Furthermore, the use of animal extracts in products can go against religious, ethical or lifestyle views [9]. As such, there is a need to better comprehend the behavioral antecedents affecting such consumption, in order to influence and reduce it altogether. When the awareness level is heightened, such as what ingredients may contain in their personal care products—consumers would be motivated to seek out ways to opt for alternatives. Although, there are certain products that are necessary in our daily lives, it is possible to minimize the use of luxury-end products with alternatives, for which the demand is price elastic (quantity demanded changes more than proportionately to a small change in product price).

The ongoing biodiversity crisis can be substantially mitigated if consumers make environmentally conscious purchasing decisions. Thus, one of the first steps towards transforming the current consumption pattern is to make consumers aware about the biodiversity impacts hidden in the life cycle of the products they consume [10, 11]. This study focuses on the level of awareness regarding the use of animal ingredients in consumer products, more specifically those use as cosmetics, fragrance, and for personal care.

While people are generally aware of the derivation of leather from animal skin, there are products that are not so obvious to recognize as they use hidden animal ingredients to manufacture them. For instance, carmine cochineal is a scale insect that has a large-scale commercial value [12, 13], and around 70,000 of these beetles are harvested to produce one pound of red dye which is extensively used in the cosmetic industry [12-14]. The basis of cosmetics and fragrances can sometimes be formed using derivatives such as musk, which is a glandular secretion from animals, and ambergris, a substance found in the digestive system of whales. Although they have now been replaced by synthetic alternatives, wild-sourced plants are still used in the cosmetics and fragrance industry [15].

However, very limited research has been conducted on

whether consumers are knowingly purchasing products that contain animal-based ingredients [16]. Hence, an open question needs to be explored in the literature regarding awareness on animal ingredients used in products: how does the concept of sustainability materialize on personal care product labels? Although there has been an increasing concern and demand for products that are sourced sustainably, knowledge gaps still exist about consumers' awareness and consumption levels of products with inputs of animal ingredients. It is imperative because no single study has been conducted on understanding the awareness and purchasing patterns of products containing animal ingredients in a highly-populated country like Bangladesh that consists of diverse cultural and religious backgrounds. Therefore, this study aims to find out the extent of people's awareness on the ingredients used in personal care products in the context of Bangladesh, and if their level of consumption pattern is largely due to their lack of knowledge on the raw materials used.

2. Materials and Methods

2.1. Design of the Study

The study was performed using both qualitative and quantitative methods over a period of two months from the beginning of January to the end of February 2017 in Dhaka city. Data were collected through survey questionnaire that used a simple randomized sampling. Descriptive statistics for socio-demographic variables were recorded and rest of the data was entered into SPSS software program as variables. Graphical analysis was conducted using MS Excel. Significance of findings ($p < 0.05$) was identified and reported. The inclusion criteria of the respondents were two: age ≥ 18 years and must reside in Dhaka. A product survey was conducted to observe the brands of products used by the respondents. The most commonly used product brands were identified and three select super stores in Dhaka were visited in order to examine the current state of the animal ingredients present in the items as mentioned by the consumers. The store selection criteria were dependent on the factors such as 'diverse range of products,' 'affordability,' 'availability of animal-based and non-animal-based product alternatives,' and 'accessibility of the shops'. Next, the primary data were collected through an online questionnaire which was composed of three sections: demographic characteristics of respondents; consumption pattern of products containing animal derivatives; and their level of awareness of the ingredients used and their likeliness to continue these products given they contained significant amounts of animal-derived ingredients on a five-point Likert scale, where 1=very low to 5=very high. The participants were also asked

if they read the ingredients of the products while purchasing them and their responses were measured as “Yes “ or “No”.

2.2. Sampling Procedures

The sample size was determined by:

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

where n= sample size, Z= Z statistic for a level of confidence, P=expected prevalence, d= precision

For the level of confidence of 95%, Z value is 1.96. As no previous study was found in this topic, sample size was calculated taking prevalence to be 50% which resulted to 384. Although the sample size was 420 after addition of 10% interval to manage the non-response error, the research made use of data of 315 respondents as a result of missing data and incomplete surveys in the rest. The author made use of online survey so as to reach more consumers over a larger geographic area; minimum age criterion was 18 years.

2.3. Statistical Analysis

The data collected was analyzed using SPSS version 20.0. An independent t-test was applied to determine any significant difference in the awareness levels experienced by the male and female respondents. In order to assess the consumption behavior of the respondents after awareness on the ingredients used, a paired sample t-test was performed. Logistic regression was used to explore the relationship between the dependent (consumption pattern of products containing animal derivatives) and independent variable (awareness level of the respondents which is a function of knowledge and attitude). A multiple regression analysis was performed to assess the leading factor that influences awareness among the two independent variables (knowledge and attitude). Then, a one-way ANOVA with post hoc Tukey HSD test was employed to compare age groups with significant differences in their awareness levels. Cross tabulation was performed on various religious groups on their difficulty of avoiding such products. A p-value of ≤ 0.05 was considered for all statistical analysis significant.

2.4. Challenges and Limitations

First, the questions used in the survey were not validated due to the novel nature of the study as well as a lack of validated questionnaires available for use in this particular subject area. This has limited the comparisons between past and present trends of consumption of products with animal derivatives. Secondly, time and resource constraints did not allow for a larger number of respondents to be included, which would have made the relationship between the variables stronger.

Therefore, it limits the applicability of the results to a larger and more general population. Third, it is also possible that not all respondents understood the terminology being used and therefore, there were some misguided answers. Finally, while it is justifiable to assume most consumers will decrease their consumption of luxury products containing animal derivatives after awareness campaigns, the assumption cannot be applied as a generalization as many-a-times willingness to do something does not result in actual action.

3. Results and Discussion

3.1. Demographic Features of the Respondents

Of the 315 respondents, females were almost as close as males who accounted for 44.8% of the total. About 90% were aged between 18–30 years, 8% were 31– 45 years, 46–60 years and 61 years and above both accounted for 1% each. More than 70% had a bachelor’s degree and 18% with a Masters degree or higher. Students made up to 46% of the sample, 32.1% of the respondents were in private jobs, 6% in public jobs, and 5.7% in business. Also, 33.3% of the respondents did not have any income while 27.3% had income of less than 20,000 BDT (around 240 USD). Income of BDT 70,000 (around 833 USD) and above accounted for less than 5% of the sample each. About eighty-eight percent of the respondents were Muslims, 8.3% were Hindus, 1.9% were Christians, and 1.9% were Agnostic.

3.2. Awareness Levels

3.2.1. Consumers’ Existing Awareness Levels on Animal-derived Ingredients Used in Personal Care Products

When asked if the respondents read the ingredients of the products, only 61% answered that they read the ingredients of the products the first time they them. So, even though majority of the consumers read the ingredients the first time they buy the products, they are not fully aware of the animal ingredients used as shown in Figure 1. It is important to understand the demographic background and their perception towards green products because there is significant association among the awareness of consumers towards green products and age, geographical area, educational level and income [17-19]. In this study, as the demographic shows that the education level is high and most of the respondents are comprised of students, the expected awareness levels should be high. However, based on the results, respondents’ awareness on raw materials used in products was approximately close to moderate (an average of 2.4 out of 5), but their awareness on animal based ingredients and the extent to which they hear ranges from 2.2 to 2.3, which is

low. Nevertheless, they believe that they should be made highly aware (an average of 3.6 out of 5) if a product contains significant animal ingredients; they are likely to reduce their consumption to low levels (average of 2.2) after they are aware of the significant derivatives used. Although natural and plant-derived ingredients are becoming more popular worldwide and products with animal derived

ingredients are gaining negative attitude due to their production processes [5, 16, 19] results indicate that consumers in Dhaka do not show high levels of awareness. One of the reasons for this could be that the animal ingredients are usually hidden in the barely decipherable chemical names and consumers are not able to notice it.

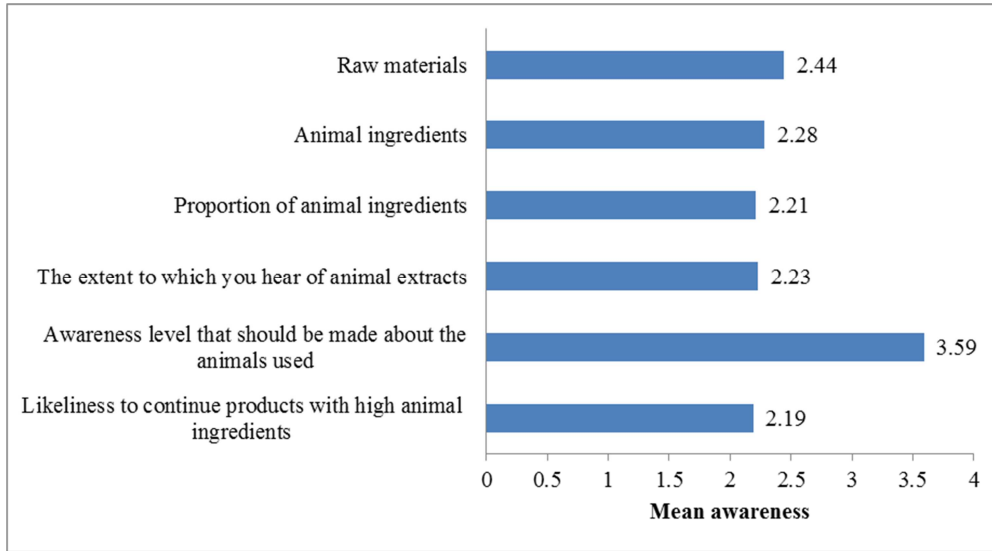


Figure 1. Respondents' existing awareness levels on animal-derived ingredients.

3.2.2. Awareness and Consumption Level Between Male and Female Respondents

For each of the questions regarding consumption and awareness levels, the mean for male and female responses were derived (Table 1). The mean indicates that both male and female of the sample respondents have relatively low level of awareness. Even though mean awareness of male is slightly more than females, the result is insignificant since the p value > 0.05 . Thus, sex did not indicate much difference in their awareness levels as all the p -values were statistically insignificant. Overall, consumers lack knowledge about the animal ingredients used in the products and hence, both male and female respondents exhibited low levels of awareness. They believed that they should be made aware of the animal derivatives used in the products. It was expected that the male respondents would show indifference to the animal ingredients used, however, they also want to be made aware and would reduce it to low

levels of consumption (Mean, Male: 2.29; Mean, Female: 2.08) had there been high usage of animal extracts in their products. However, there were differences in consumption trends of shampoos, moisturizers, body lotions, soap and antiperspirants between the male and female respondents. Women, for instance, tend to consume much greater quantities of facial moisturizers and body lotions than men. Even though the consumption trend of hair cleansing products is a bit similar in both genders in moderate quantities, the usage of shampoos was slightly more prevalent among the female. This could be attributed to the length of the hair as females have longer hair than males in general. The prevalence of personal care products use was statistically significantly higher for females than males apart from soap and antiperspirant. For men, antiperspirants are essential cosmetics products for daily use. This could be due to the fact that men tend to stay out for longer hours than women, so they perspire more and thus, the need to use more soap and antiperspirant.

Table 1. Mean usage and awareness levels of male and female consumers.

	Male	Female	Sig.
Usage			
Shampoo	3.34	3.63	0.006
Moisturizer	2.15	3.10	0.000
Body lotion	2.25	3.06	0.000
Soap	2.48	2.24	0.24

	Male	Female	Sig.
Antiperspirant Awareness	3.06	2.88	0.324
Raw materials	2.44	2.43	0.935
Animal-based ingredients	2.29	2.26	0.803
Proportion of animal derivatives	2.29	2.11	0.151
Extent to which you hear	2.28	2.16	0.349
Awareness level that should be made to consumers	3.61	3.57	0.715
Your usage after awareness	2.29	2.08	0.071

Scale: 1 = very low, 2=low, 3=moderate, 4=high, 5=very high.

3.2.3. Impact of Attitude and Knowledge on Awareness

In order to determine whether two independent variables – knowledge and attitude – have any influence on awareness level of the consumers, a logistic regression test was carried out. In the ANOVA table given in the Appendix, as the F-value is 188.108 and the p-value is 0.00 (<0.05), the study accepted the alternate hypothesis that there is a significant linear relationship between the awareness levels of the respondents to its independent variables. A multiple regression analysis was performed in order to assess the leading factor to influence awareness among the two variables (knowledge and attitude). The results are shown in Table 2. The regression equation for awareness and its independent variables is:

$$y = 0.809x_1 + 0.39x_2 + 0.416$$

where y – awareness level, x_1 – knowledge, $m_1 = 0.809$, x_2 – attitude, $m_2 = 0.39$ and $c = 0.416$,

written as, Awareness Level = $0.809 \text{ knowledge} + 0.39 \text{ attitude} + 0.416$

The attitude coefficient is 0.39. However, since the p value (0.353) of attitude is more than 0.05, it becomes redundant in the equation. This means that attitude was not found to be significant in influencing awareness of the respondents. The knowledge coefficient is 0.809 at $p < 0.05$ (sig.=0.000). Hence, it can be concluded that an increase in knowledge will lead to an increase in the level of awareness of the sample respondents. Consumers' awareness is highly influenced by knowledge which may be a crucial drive while making purchasing decisions.

Table 2. Coefficient Regression.

Dependent Variable	Independent Variables	Standardized Coefficient (Beta)	T	Sig.
Awareness	Knowledge	0.809	18.934	0.000
	Attitude	0.039	0.930	0.353
	(Constant)	0.416	3.210	0.001

3.3. Consumption Pattern

3.3.1. Consumption Pattern and Awareness Level of Different Age Groups

Figure 2 compares the mean consumption and awareness between different age groups. From the graph, the mean consumption of 18 to 30 years of age and 61 years and above have high consumption pattern. Respondents of 46 to 60 years of age showed high levels of awareness. This shows that middle aged group (46-60 years of age) show more levels of awareness and low levels of consumption than their younger and older counterparts. The findings also indicate that consumers who have high levels of awareness are more likely to have consumed less products and vice versa. Between 18-30 years of age, the mean consumption was at moderate levels; however, the awareness levels were low which indicates that due to lack of knowledge, their consumption behavior is slightly higher than their older

counterparts. However, both awareness levels and consumption pattern were high among 31-45 years of age, which could be due to lack of availability of vegan products, high prices in vegan products or their indifference in attitude of the ingredients used in them. Since familiarity is an important drive, their attitudes towards particular products and brands could not be easily changed by awareness. According to Kaur, [20] branding is a very important variable in the context of purchasing behavior of cosmetics. The brand awareness, brand loyalty and brand visibility are some factors which are proven to be important in the purchase of cosmetics. Factors such as price, quality and brand still dominate the mind of consumers during the purchase of cosmetics [20]. The graph of respondents aged 61 years and above showed that their mean consumption was moderate (Mean=3.00) but awareness was low (Mean=2.00). This shows that respondents in this age category have low levels of awareness which is why their consumption behavior is higher.

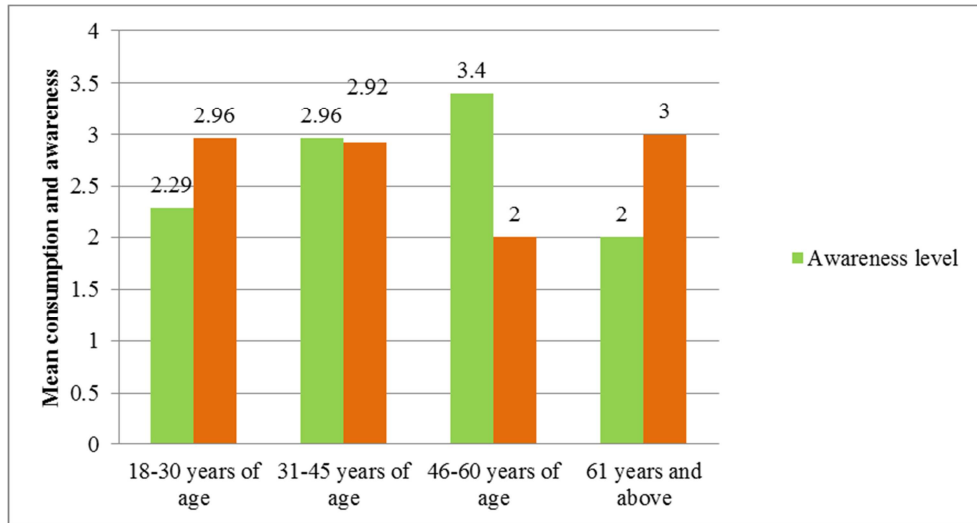


Figure 2. Comparison of consumption pattern and awareness level of different age groups.

3.3.2. Consumption Behavior of the Respondents After Awareness of the Animal Ingredients Used

The consumption behavior of the respondents before awareness is taken to be statistically same as the behavior after awareness for the null hypothesis. The alternate hypothesis is such that the consumption behavior of the respondents before awareness is statistically different that the behavior exhibited after awareness. A paired sample t-test is executed in order to find whether a significant difference exists in the consumption behavior of the respondents after awareness. The mean value of the consumption level drops from 2.95 to 2.19 indicating existence of the effect of awareness. Since the p-value of the paired t test is less than 0.05 (sig. = 0.000), the alternate hypothesis is accepted that the consumption behavior of the respondents before awareness is statistically different that the behavior exhibited after awareness.

3.4. Relationship Between Consumption Pattern and Awareness Level

The null hypothesis is considered that there is no linear relationship between consumption pattern and awareness level of the respondents. The alternate is that such a relationship exists between them. The results in the ANOVA table state that F count is 3.634 and the p-value is 0.058 (>0.05). However, since it marginally exceeds 0.05, the alternate hypothesis is accepted that the awareness levels of the sample respondents have an impact on their consumption pattern. A regression equation has been developed:

$$\text{Consumption Pattern} = 3.169 - 0.095 \text{ Awareness level,}$$

where y= consumption pattern, c= 3.169, x= awareness level and m= -0.095

From the equation it can be concluded that an increase in awareness level will lead to a decrease in consumption habit of the animal-based personal care products since the m value is negative.

3.5. Purchase Considerations Based on Ethical, Religious and Health Issues

The respondents were asked to rate on a Likert scale of 1 to 5 how likely they would continue to use products given they contained significant amounts of ingredients of animal origin, and majority (61.3%, N=193) answered they would try use it low to very low levels, because they feel that animals have to go through a lot of suffering in order for those products to be made (Figure 3). Furthermore, the analysis of the survey revealed that most respondents thought it was cruel to use animals that is not directly required for our survival and especially when we can easily get by without them. Others pointed out that apart from animal welfare issue the fact that they are being used in our daily items is very unappealing. They would rather prefer plant-based products since they are more simplistic and healthier on skin. They feel that products made with animal derivatives have more chemicals and preservatives in them. Moreover, 29.5% (N=93) answered they would reduce it to moderate amounts. Respondents who said they would reduce it to moderate amounts explained that it depended on various factors such as if the animal-based ingredients come from a humane and sustainable source. Some other factors such cost-effectiveness, alternatives, necessity and availability were also important, according to them. They also opined, in the context of purchasing behavior of cosmetics, branding is a very important variable. Also, the materials used in the making of cosmetics and toiletries are unknown by a large part of society. For those who mentioned they are highly (7%, N=22) to very highly

likely (2.2%, N=7) to use products containing animal-derivatives, it is because such products are readily and easily available in the market. Time is also a big factor in purchasing these products. Often they do not have the time to always check the ingredients or read the labels before they buy and thus, accessibility and availability becomes a huge reason they are highly likely to use these products. Also, botanical alternatives are not always available. Others feel that they know about them but still use it because animal ingredients are present in many products and therefore, it impossible to avoid them all the time. Some mentioned only minor portions of animal ingredients are used making it negligible and they are indifferent to it as long as they are effective.

Next, a cross-tabulation (Table 3) was performed to find out the responses of different income groups if they would continue to products that contained animal extracts that may conflict with religious beliefs, and the outcome was the same. The majority portion of the respondents for each income group stated that they would stop consuming. This shows religion has a significant effect on the consumption pattern. This also implies that although there can be certain barriers such as costs, availability, effectiveness etc. of the vegan products, most of the respondents feel that it is not difficult to

reduce consumption if there is willingness to do it. Globally as people are becoming more conscious of the environment and health, the concept of consuming halal products has gained popularity since it does not limit to food only [21-23]. Halal products are gaining awareness and changed the buying behavior of the Muslim consumers by increasing demand among the 2.4 billion Muslim consumers worldwide [24]. Many products can contain ingredients of animal, vegetable, or synthetic origin, such as glycerin. This can be difficult for consumers to recognize as often companies remove the word ‘animal’ from their ingredient list to avoid putting off conscientious consumers. In addition, products can also contain traces of alcohol. This may have implications in terms of religious compliance [21]. Many products use animal based product formulations, which may or may not have been slaughtered according to Islamic law [21] or may contain porcine materials. Therefore, for many Muslim consumers it becomes highly imperative to check the ingredients of the items that they use on a daily basis. Similarly, if a product contains a formula derived from bovine sources, then it would be unsuitable for Hindus, Buddhists among many other religious groups as cow is a sacred animal for them.

Table 3. Impact of religion on their consumption pattern in every income group.

Income	If you found out that you favorite product contains ingredients derived from animals that may conflict with your religious beliefs, would you continue using them?		
	Yes	No	Maybe
No income	23	60	22
Less than 20,000	16	60	10
20,000-39,999	9	37	12
40,000-69,999	7	29	7
70,000-100,000	3	11	1
100,001 and above	2	5	1

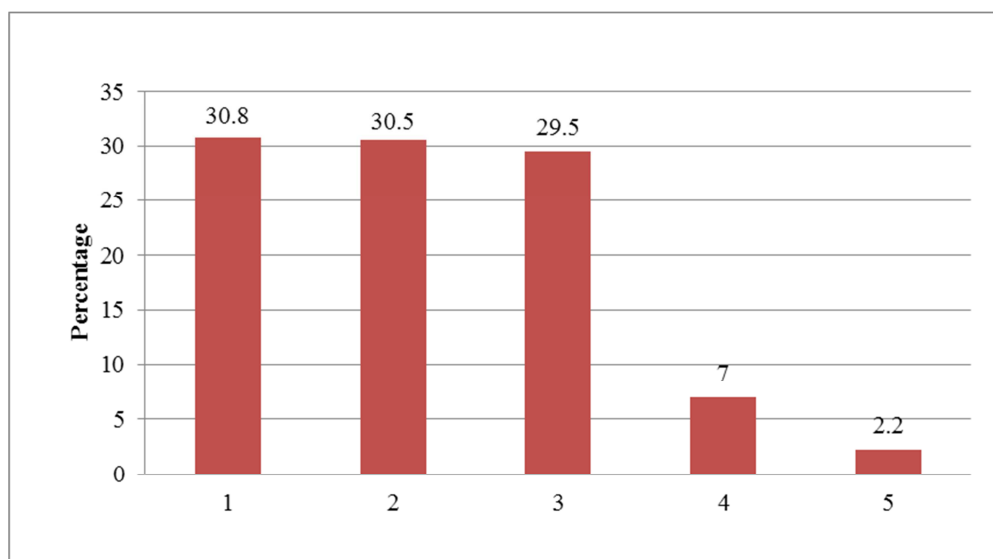


Figure 3. Respondents' likeliness to continue using products with significant animal derivatives after awareness (1=very low, 2=low, 3=moderate, 4=high, 5=very high).

4. Conclusion

Suggestions from the research analysis include making it mandatory for producers of consumer products to clearly mention the animal ingredients used instead of barely understandable names, so that people can be aware of it, educating consumers about the ingredients used and learn the names of the hidden ingredients as much as possible, increasing self-awareness from the consumers' side as well to minimize animal derivatives' consumption that may result from a lack of understanding. Authors believe that looking for a product that is both vegan and cruelty-free will be smarter, than just avoiding animal-tested products as these products are both animal-cruelty free and devoid of animal ingredients. By understanding the consumer's purchase intentions, it will help the retailers cater to their needs and provide products accordingly. Even if consumers do not take animal rights as a concern, it may not be appealing to use animal-based ingredients on skin on a day-to-day basis. From the study, it can be concluded that an increase in awareness will lead to a potential fall in the consumption of products with animal derivatives for the Dhaka dwellers. It is also very important to be aware of the brands that use considerable amount of animal products so we can minimize our use of those goods. It is especially essential to reduce demand of those products that use endangered species. It is also important to increase the supply side for vegan products in Dhaka as there are people who are aware, but need a place where they can implement their awareness and make purchase decisions accordingly. Being informed will help consumers make rational choices for ourselves and for a healthy environment. Therefore, the key is to get some idea about the ingredients used and take the time to look at the ingredients closely before making product choices.

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