

Retraction

Retracted: Computational Technologies for Pakistani Consumers' Understanding of the Country-of-Origin Label for Fruit and Vegetable Products in Social Networks

Security and Communication Networks

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Security and Communication Networks has retracted the article titled “Computational Technologies for Pakistani Consumers' Understanding of the Country-of-Origin Label for Fruit and Vegetable Products in Social Networks” [1] due to concerns that the peer review process has been compromised.

Following an investigation conducted by the Hindawi Research Integrity team [2], significant concerns were identified with the peer reviewers assigned to this article; the investigation has concluded that the peer review process was compromised. We therefore can no longer trust the peer review process, and the article is being retracted with the agreement of the Chief Editor.

The authors do not agree to the retraction.

References

- [1] B. Wang, H. Li, C. M. Zhou, and T. Wu, “Computational Technologies for Pakistani Consumers' Understanding of the Country-of-Origin Label for Fruit and Vegetable Products in Social Networks,” *Security and Communication Networks*, vol. 2022, Article ID 1865952, 8 pages, 2022.
- [2] L. Ferguson, “Advancing Research Integrity Collaboratively and with Vigour,” 2022, <https://www.hindawi.com/post/advancing-research-integrity-collaboratively-and-vigour/>.

Research Article

Computational Technologies for Pakistani Consumers' Understanding of the Country-of-Origin Label for Fruit and Vegetable Products in Social Networks

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Whether or not consumers consider information about origin in their routine food purchase decisions is a contentious issue. Usage of social networks has redefined lifestyle and culture, and firms are finding it difficult to understand their customers. This study aims to investigate the effect of social networks (digital marketing) on Pakistani consumers' understanding of the CoO (country-of-origin) label for F&V (fruit and vegetable) products and its relative importance in daily purchase decisions of fruit and vegetable products. In a random survey of 797 consumers in two Pakistani cities, we found that the relationship between the CoO information and the daily F&V product choices of Pakistani consumers was less important than other factors. Consumers are mistaken about the CoO label, with only one-third of respondents correctly understanding the difference between labels of "made in..." and "product of..." Therefore, mandatory CoO label policies may increase costs and reinforce consumers' misinterpretation of the meaning of these labels; obtaining a "user-friendly" CoO label serves only those consumers who properly understand the information. This study contributes to understanding of the extent to which consumers are competent in their knowledge and understanding of these informational labels.

1. Introduction

Whether consumers consider the country-of-origin (CoO) information in their daily F&V product purchase decisions is a controversial issue. The influence of CoO information on consumers' F&V product evaluations and purchasing decisions is not as significant as other cues such as price and brand [1, 2]. In addition, the potential benefits of providing consumers with CoO information may not be enough to cover the cost of mandatory labeling [3]. And less is known about what information consumers need from us and how this information affects their purchasing decisions [4, 5]. Regardless of whether the status of CoO labels is mandatory or voluntary, we know very little about the extent of consumers' perception and understanding of these information labels [6]. Hence, the aim of this paper is to evaluate

consumers' perception and understanding of CoO information on daily F&V product purchases [7].

The primary goal of F&V product purchase decisions is not to make the "optimal choice," but to make a satisfactory choice while minimizing cognitive effort [8, 9]. Thus, consumers' optimization of time and effort relies on "extremely simple and heuristic choices or strategies, making repeated decisions with low importance or participation" [10]. This method of understanding consumers' purchase decisions for F&V products is consistent with the research of Kahneman and other scholars in the field of psychology and economics [11]. Their work is based on the idea that people may simplify the complex task of evaluating probabilities and predicting values into ordinary decision-making rely on a limited number of heuristic principles [12]. Through a series of positive experience, negative experience, and neutral

experience, the postpurchase evaluation tends to be stable gradually, and consumers formed a general purchase principle or choice strategy and are able to use these strategies to make decisions quickly and easily [13]. Consumers then adapt these rules of thumb based on feedback from the results to make better purchasing decisions in the future [14]. Due to the low involvement of most fruit and vegetable product purchases, the use of heuristics as a basis for understanding consumer decision-making processes is supported in fruit and vegetable product choice research [15]. Hamlin points out that in a given product category, consumers typically start from exposure to a product signal, decide what to buy in less than five seconds, look for a set of cues based on heuristic information in their memory, and develop an evaluation framework [15]. In this way, certain cues can trigger relevant heuristic choices or strategies to measure the quality of competing products and make choices. Faced with multiple cues, many consumers may ignore certain cues, especially when presented in detail, due to a lack of time and motivation to process a large variety of information. Kimura studied the willingness of 120 Japanese college students to buy fruits and vegetables at different information levels, willing to pay higher prices for products with detailed information [16].

Studies in economics, psychology, consumer behavior, and food choices have identified some factors that affect product quality, and these factors trigger consumers' heuristic choices to purchase F&V products. Previous studies have shown that the most important elements affecting product quality are brand, product characteristics or appearance, price, and its retail reputation [17–19]. Among the clues available at the time of purchase, CoO serves as a signal to infer the quality of F&V products and evaluate their social acceptability [8, 20]. If consumers have limited or incomplete (intrinsic) information on product quality, they tend to rely on external properties while evaluating a product [21]. Therefore, for consumers with limited experience or knowledge, who are faced with more and more uncertainties in the safety of F&V products, the CoO of F&V products may be a signal to predict the quality of F&V products before purchasing. In addition, F&V products' selection decisions are influenced by visual cues, such as product packaging and color [22]. When consumers actively search for products, they are willing to pay higher prices for products with detailed information. On the other hand, when participants are only allowed to read information, they will pay the most for products with a moderate amount of information. The latter situation reflects the most habitual purchase decision of F&V products at the time of purchase. Thus, consumers may choose among the information they search for and use it in daily F&V product purchase decisions [8]. In addition, consumers use simplified heuristics to limit decision-making; hence, merely providing information may not be enough. Generally speaking, information must be both available and easy to process for use handily.

The CoO label of F&V products assumes that consumers are motivated to search for CoO information, understand the CoO label, and make wise purchasing decisions based on this information. Through investigating consumers'

understanding of common CoO labels, a few studies questioned the accuracy of consumers' understanding [8]. A qualitative study of major household shoppers in the Germany showed that participants believed that CoO indicated the country-of-origin of the product, not the country where the "last major change" occurred. In a comprehensive survey, only 12% of respondents accurately understood CoO label (defined as the place where the last major change in food occurred) [8, 23]. Except for evaluating consumers' use of CoO labels, it is also necessary to evaluate consumers' understanding of CoO label information in order to formulate appropriate labeling regulations and public policy guidelines for F&V products [19].

In summary, the research purpose of this thesis has three aspects. First of all, it is to determine the relative importance of CoO information in the purchase decision of consumers' daily F&V products; secondly, it is to evaluate consumers' understanding of the CoO label purchased by daily F&V products; lastly, it aims to evaluate consumers' perception of CoO label information.

2. Materials and Methods

2.1. Respondents. Shoppers over the age of 18 are eligible to participate in this survey. It is very important to conduct a survey immediately after purchasing F&V products; hence, a large supermarket was selected as the research site. In order to come into contact with participants from different socioeconomic fields, five supermarkets in Faisalabad and Lahore, Pakistan, were selected. The survey was pretested in a large supermarket in Faisalabad to evaluate the content and timing of it. A total of 20 respondents participated in the pretest. Based on the feedback received, it was decided to let the participants choose F&V products in order to reduce their bias and to increase the comparison of "Made in Pakistan" and "Products of Pakistan" labels to inquire how the participants understand the different CoO labels [8]. The actual survey interviews were conducted from 4 pm to 8 pm in 23 days between 31 May to 22 June 2019, in order to engage with as many Pakistani shoppers as possible. Shoppers are randomly selected. After each interview, the next shopper who has checked out from the supermarket will be randomly selected. In order to eliminate the prejudice caused by different types of people using different checkout exits, shoppers from each checkout exit will be randomly selected.

Punjab province is home to more than 50% of the country's population in Pakistan, and Lahore and Faisalabad are the second and third largest cities in the country, making them representative. A total of 1291 people were selected when they left the supermarket, 499 in Lahore and 792 in Faisalabad. Among them, 329 from Lahore and 468 from Faisalabad were willing to participate in the interview, and the rest refused. The response rate was 61.7% of the sample.

2.2. Survey Process. Firstly, once the participants agree to participate in the survey, they are asked to choose the F&V products they have just purchased from the trolley, at the

same time, to describe the factors they consider when choosing to purchase items until all the factors listed on the participant's list are answered. This is a spontaneous part of the interview. Secondly, the respondents were asked if they knew which country the selected product came from, and if so, how did they know it? Then, the participants were asked whether the knowledge of CoO affected their purchase; if so, why? If not, why not? Participants were asked whether they checked the labels of F&V products to find out the CoO; if so, why? If not, why not? Subsequently, the participants were shown three different CoO labels in a random order and asked to describe how to interpret each of it. Participants were asked whether there is a difference between the CoO labels of "Made in Pakistan" and "Product of Pakistan." If their answer is yes, they will be asked to describe what the difference they understand is. Lastly, the participants were asked to fill out a form containing their demographic information. The interviewer will express his gratitude to the participant for their time and cooperation with a piece of chocolate.

2.3. Data Analysis. The survey data have been collated and examined the accuracy of it, and analyzed with SPSS. Code the questionnaire items, and enter the code into the software program. A total of 20 survey item data are entered. Over 797 questionnaires were entered, and the coding was refined again; some codes were merged, others were deleted, all 797 surveys were recorded, and data input and coding were examined against each other to ensure accuracy, consistency, and reliability. It was accomplished under the guidance of a researcher who is experienced in qualitative data, and I would like to express my gratitude to him. Due to the nature of the data, we calculated the frequency and used chi-square test to determine important relationships between related variables. Besides the notes, statistical processing was performed with $p < 0.05$ as the cutoff value. Although there is a statistically significant relationship between the age variable and the participants' knowledge and understanding of CoO labels, no such statistical difference was found in the gender or ethnicity of the participants.

3. Results

3.1. Demographic Characteristics. Some subtle differences were found while comparing the sample statistics with the population of Pakistan. Firstly, compared with the Pakistani population, the proportion of female participants in the sample is higher (65%), as shown in Table 1, which reflects the advantages of Pakistani female household shoppers. Secondly, the age distribution of the participants is roughly similar to that of the Pakistani population, although the proportions of participants are 20–29 years old and 40–69 years old. These differences are attributed to the fact that adults in this age are the main shoppers in family supermarkets.

3.2. Factors Affecting Consumers' Decision-Making in Purchasing F&V Products. Participants were asked to choose a fresh or packaged F&V product from the trolley and were asked "What factors did you consider when choosing this

TABLE 1: Demographic characteristics of respondents.

Category	Amount	Ratio (%)
Gender		
1 = male	279	35.00
2 = female	518	65.00
Age		
1 = 18–27 Y/A	165	20.70
2 = 28–37 Y/A	187	23.46
3 = 38–47 Y/A	179	22.46
4 = 48–57 Y/A	189	23.71
5 = over 57 Y/A	77	9.66
Families		
1 = 3 P and below	57	7.15
2 = 4 people	152	19.07
3 = 5 people	249	31.24
4 = 6 people	263	33.00
5 = 7 P and above	76	9.54
Education backgrounds		
1 = 6 Ys and below	63	7.90
2 = 7–12 Ys	82	10.30
3 = college	103	12.90
4 = bachelor	354	44.40
5 = master and above	195	24.50
Monthly household incomes		
1 = below 20,000 Rs	147	18.40
2 = 20,000–50,000 Rs	143	17.90
3 = 50,000–80,000 Rs	194	24.40
4 = 80,000–110,000 Rs	175	22.00
5 = 110,000 Rs and above	138	17.30
Abroad experience		
1 = yes	231	29.00
0 = no	566	71.00

Source: collation of this survey data.

product?" until all the factors listed by them. In all cases, no more than four reasons were provided. Among the food products selected by the participants, 57% are fresh agricultural products (fruits and vegetables), and the remaining 43% are processed and packaged F&V products. In the processed F&V product group, jam, ketchup, apple juice, canned fruit, and vegetables are the most common categories. It can be seen from Table 2 that price (27.73%), taste (10.16%), health (10.54%), and quality (5.9%) are the main factors affecting participants' purchase of F&V products.

3.3. Knowledge and Acquisition of the CoO Information. Among the shoppers participated, 53% said they knew the CoO of the F&V products they chose, and 90% of them were correct. The participants confirmed that most of the chosen F&V products came from Pakistan (71%), followed by China (14%). The most common way for participants to obtain CoO information is through the brand (25.6%), reading the CoO label before purchasing (9.2%), based on assumptions (12.3%), guessing (8.3%), or prior knowledge (12.9%).

3.4. Consumers' Use of CoO Labels. A total of 422 participants (53% of the total sample) stated that they would consider the CoO label when purchasing F&V products. As

TABLE 2: Analysis of shopping considerations.

Considerations	First reason	%	Second reason	%	Third reason	%	Fourth reason	%
Price	221	27.73	119	14.93	42	5.27	12	1.51
Taste	81	10.16	78	9.79	36	4.52	9	1.13
Dinner materials	112	14.05	63	7.90	23	2.89	5	0.63
Health	84	10.54	62	7.78	24	3.01	10	1.25
Quality	47	5.90	42	5.27	19	2.38	1	0.13
Family or child needs	55	6.90	26	3.26	14	1.76	4	0.50
Value	32	4.02	55	6.90	31	3.89	0	0.00
Loyalty	17	2.13	21	2.63	10	1.25	2	0.25
Appearance	23	2.89	30	3.76	16	2.01	5	0.63
Brand	21	2.63	24	3.01	11	1.38	3	0.38
Discount	23	2.89	23	2.89	10	1.25	6	0.75
Impulse	11	1.38	15	1.88	8	1.00	3	0.38
Ingredient	28	3.51	16	2.01	5	0.63	1	0.13
CoO	42	5.27	19	2.38	12	1.51	2	0.25
No answer	0	0.00	204	25.60	536	67.25	734	92.10
Sum	797	100.00	797	100.00	797	100.00	797	100.00

Source: collation of this survey data.

TABLE 3: Analysis of reasons for consumers searching CoO labels.

Reasons for searching CoO labels	First reason	Second reason	Sum	%
Prefer Pakistani products	120	57	177	41.94
To avoid products from country A	66	5	71	16.82
Prefer products from a certain country	72	41	113	26.78
Do not trust other countries	18	18	36	8.53
Curiosity	26	11	37	8.77
To fulfill diet standards	29	19	48	11.37
Freshness/taste	14	3	17	4.03
Quality	34	14	48	11.37
Others	10	2	12	2.84
Do not want imported products	25	12	37	8.77
No answer	8	240	—	—
Sum	422	422	—	—

Source: collation of this survey data.

TABLE 4: Analysis of reasons for consumers skipping CoO labels.

Reasons for skipping CoO labels	First reason	Second reason	Sum	%
Disinterest	168	54	222	59.20
Higher priority in price	101	35	136	36.27
Short timing	42	14	56	14.93
Faith on every products' sale in supermarket	39	23	62	16.53
Others	21	5	26	6.93
No answer	4	244	248	66.13
Sum	375	375	—	—

Source: collation of this survey data.

shown in Table 3, these participants said that they read labels mainly because they prefer to purchase Pakistani or local products (41.94%); they do not want to purchase F&V products from country A (16.82%); they prefer products from a certain country (26.78%); they do not trust other countries (8.52%); they are curious (8.77%); they want to support Pakistani/local products (10%); they check labels to evaluate standards of F&V products (11.37%).

On the other hand, 375 participants (47%) stated that they never check CoO labels. As shown in Table 4, the main and secondary reasons for those shoppers who never check

CoO labels are their disinterest in it (59.2%), their higher priority in price (36.27%), their faith in every product sale in the supermarket (16.53%), and their short timing during shopping (14.93%).

3.5. Consumers' Understanding of CoO Labels. The survey of participants' perception of three common labels, "Made in Pakistan," "Product of Pakistan," and "Buy Pakistan Made," was conducted. Participants hold various interpretations of these labels as shown in Table 5. 619 participants (77.67%)

TABLE 5: Consumers' understanding of label "Made in Pakistan."

Interpretations of the label "Made in Pakistan"	First reason	%	Second reason	%	Sum	%
Made in Pakistan	588	73.78	31	3.89	619	77.67
Processed in Pakistan	82	10.29	63	7.90	145	18.19
Processed with imported raw materials	41	5.14	29	3.64	70	8.78
Products from Pakistan	29	3.64	19	2.38	48	6.02
Pakistan as CoO	19	2.38	11	1.38	30	3.76
Related to processed products	15	1.88	49	6.15	64	8.03
Have no faith in it	9	1.13	12	1.51	21	2.63
Support domestic products	7	0.88	23	2.89	30	3.76
Have faith in it	7	0.88	17	2.13	24	3.01
No answer	0	0.00	543	68.13	—	—
Sum	797	—	797	—	—	—

Source: collation of this survey data.

TABLE 6: Consumers' understanding of label "Product of Pakistan."

Consumers' interpretations	First reason	%	Second reason	%	Sum	%
Made in Pakistan	246	30.87	46	5.77	292	36.64
Product of Pakistan	198	24.84	97	12.17	295	37.01
Products from Pakistan	132	16.56	68	8.53	200	25.09
Pakistan as CoO	92	11.54	39	4.89	131	16.44
Packaged in Pakistan	44	5.52	34	4.27	78	9.79
No idea	29	3.64	26	3.26	55	6.90
Processed abroad	22	2.76	5	0.63	27	3.39
Have no faith in it	12	1.51	12	1.51	24	3.01
Processed with imported raw materials	10	1.25	9	1.13	19	2.38
Related to production	9	1.13	18	2.26	27	3.39
Own by Pakistan company	3	0.38	8	1.00	11	1.38
No answer	0	0.00	435	54.58	—	—
Sum	797	—	797	—	—	—

Source: collation of this survey data.

correctly stated that the label "Made in Pakistan" on a product means it was produced in Pakistan, 145 (18.19%) believed that the product was produced and processed in Pakistan, and 70 (8.78%) believed that the product could be produced with imported raw materials.

Table 6 shows 12 different interpretations of label "Product of Pakistan." 295 participants (37.01%) hold the same idea with "Product of Pakistan," which belong to the second common interpretation, and 292 (36.64%) assumed that products are made in Pakistan. Among the samples, 25.09% participants stated original ingredients or products are from Pakistan, 16.22% regarded Pakistan as its CoO, and 9.79% deemed it was processed in Pakistan. 70.4% participants supposed there is a difference between the labels "Product of Pakistan" and "Made in Pakistan," but only 28.7% of them can name it correctly. Overall, 26.4% participants misinterpreted these labels, and 16.3% believed there was a difference while have no idea about it. Nearly one-third (29.6%) of participants held that there was no difference between them.

It can be seen from Table 7 that label "Buy Pakistan Made" owned 15 various interpretations. Approximately one-third of participants believed products with that label were produced in Pakistan. 28.98% considered it as advice of purchasing products made in Pakistan. At the same time, 23.71% said the label was an inspiration of

purchasing products made in Pakistan, and 8.16% aimed to encourage consumer to purchase products made in Pakistan in favor of Pakistan manufacture and economics. In total, 128 participants related CoO label to commercial. The most interesting thing is that 30 participants (3.76%) indicated they were not convinced of or willing to believe this label.

4. Discussion

The findings of this paper confirmed and strengthened the previous research, proving the importance of CoO in the consumer's daily F&V product purchase decision [24].

4.1. The CoO Label Is Not the First Reason in F&V Product Purchasing Decision. Specifically, CoO is not the first reason when consumers choose F&V products; only 5.27% of the participants mentioned the importance. However, other factors, price, taste, health, and quality, are the main reasons that drive consumers to purchase food habitually [8, 25]. The research results of this paper show the validity and relevance of previous studies. It shows that the country-of-origin label is not the first factor, but it is still an important consideration in the choice of F&V products. When consumers notice that the production is not a domestic product, they would read

TABLE 7: Consumers' understanding of label "Buy Pakistan Made."

Consumers' interpretations	First reason	%	Second reason	%	Sum	%
Made in Pakistan	263	33.00	18	2.26	281	35.26
Purchasing domestic products	192	24.09	39	4.89	231	28.98
Inspiration of purchasing Pakistan domestic products	129	16.19	60	7.53	189	23.71
Commercial	85	10.66	43	5.40	128	16.06
Support of Pakistan domestic products and economics	39	4.89	26	3.26	65	8.16
Oblige to purchasing	21	2.63	16	2.01	37	4.64
Trademark	17	2.13	14	1.76	31	3.89
Government encouragement	15	1.88	41	5.14	56	7.03
No idea	17	2.13	4	0.50	21	2.63
Have no faith in it	9	1.13	21	2.63	30	3.76
Made from imported raw materials	5	0.63	13	1.63	18	2.26
Have faith in it	2	0.25	1	0.13	3	0.38
Owned by Pakistan company	3	0.38	24	3.01	27	3.39
No answer	0	0.00	477	59.85	—	—
Sum	797	—	797	—	—	—

Source: collation of this survey data.

the country-of-origin label carefully to identify the country-of-origin. And these studies consider CoO as a key factor in the purchase decision of consumers' F&V products.

4.2. Price Is Still the Most Important Factor in F&V Product Purchasing Decision. Price plays an important role in consumers' selection of F&V products, which is different from the most consumers' attitude toward CoO. In the purchase decision, price is superior to CoO [8]. Therefore, as there is an increase in the company's production and transportation costs, and the prices of supermarket F&V products, prices have become more important than other factors in the purchase decision of F&V products. This finding supports the view that consumers do not spend too much energy on information processing; hence, they apply heuristic choices in F&V product purchase decisions [26]. The survey shows that it is difficult for participants to provide a large number of considerations when purchasing F&V products [8]. Consumers only use one simple word to explain why they choose F&V products. It shows that consumers, who use simplified heuristic choices, lack the ability to assess and judge the source of information accurately at the time of purchase.

4.3. Consumers Will Improve Their Purchasing Habits Based on Information from the CoO Constantly. The survey shows that consumers may subconsciously process CoO information and maintain purchase habits for many years. 27.4% of participants said they were affected by CoO prompts, but only 3.5% of participants revealed that they had applied this information into their recent purchase. In particular, the participants, as consumers with accumulated long-term experience (age is a positive influencing factor), acknowledge the CoO of the products they purchased recently. Moreover, as a daily consumption, consumers would choose fruit and vegetable products based on their years of buying experience and the accumulation of lifestyle habits, and then make a decision in a few seconds. Thus, the influence of CoO information may be exaggerated by social expectation bias.

4.4. Consumers Have a Wide Range of Access to CoO Information. The majority of participants (53%) stated that they know the CoO of the F&V products they purchase, and most of them (90%) are correct, which is in contrast to the results of previous studies. The participants were able to correctly identify the CoO of F&V products they purchase, and the difference in consumers' knowledge can be explained by the following facts. A large part of the F&V products sold in Pakistani supermarkets are from domestic, which makes it easier for consumers to confirm that the products are from domestic. In the research of this paper, 71% of the selected F&V products are from Pakistan; thus, the participants may have easier access to it, hypothesis or even guessing. 25.2% of consumers said that they learned the CoO of a product based on assumptions or prior knowledge, and 8.3% of consumers said that they learned the CoO of a product by guessing. On the contrary, consumers rely on supermarket purchasers to maintain information on the quality standards of F&V products, while bypassing the need to rely on CoO independently.

4.5. Consumers Prefer Domestic Products. Consumers are fond of domestic products and influenced easily by publicity of foreign products, especially negative one. Among the 74 (9.28%) participants who were affected by CoO, most of them said that the main reason for their choice is that Pakistani/local products are of priority or better. Some participants explained that they want to show some support for the Pakistan/local economy. In addition, some participants believed that the CoO of the F&V products they just purchased reflects the improvement in product quality. 723 (90.72%) participants said that CoO information did not affect their recent purchase decision, and most of them were affected by price or nonprice factors [8]. Due to geographical and historical factors, Pakistani consumers have a strong sense of national awareness, and on another side Punjab province is a major area of fruit and vegetable, so consumers have a strong sentiment toward local fruit and vegetable

products [27]. When choosing fruits and vegetables from other countries, they would be picky and read the relevant label information carefully.

4.6. There Are Differences in Consumers' Perceptions of CoO Label. This paper also investigated consumers' understanding of the three common CoO labels. It turns out that consumers have insufficient understanding of the meaning of the three main CoO labels for F&V products. Most of the labels are printed in character on the label, and only 28.7% of the participants can correctly define the difference between "product" and "manufacturing" labels. Therefore, the majority of participants (53%) said that they would check the label, but many people did not fully understand the correct conception. There are a higher percentage of participants who expressed concern about the CoO label, which may be affected by their desire to provide an acceptable answer to society. In contrast, 3.5% of the participants (actively) revealed that they started to pay attention to CoO when purchasing F&V products recently.

5. Conclusion

It shows that CoO information is not as important as other factors influencing the current daily food choices of Pakistani consumers. Therefore, the mandatory CoO labeling policy may be inappropriate for a retail F&V product and may do more harm than good. It has implications for policy makers, consumers, retailers, and manufacturers, especially for markets that have recently launched or are considering mandatory CoO labeling for F&V products. The mandatory CoO labeling policy may increase costs and strengthen consumers' misunderstanding of it. Like nutritional product information, obtaining a "user-friendly" CoO label may only serve consumers who seek, apply actively, and correctly understand the information. In a market with mandatory ways, consumers must understand the differences between labels, because only one-third of consumers in this study understood them correctly.

In order to enrich the research, it is necessary to improve consumers' willingness to pay more attention to CoO detailed information in different formats and levels of F&V products, which will provide decision-making on CoO labels for F&V products and supermarket industry groups, consumer interest groups, and government agencies. It also needs to investigate the positions and interests of other stakeholders, especially the opinions of food manufacturers and supermarket retailers, and the parties responsible for enforcing labeling regulations. [27].

Data Availability

The labeled data sets used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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References

- [1] J. P. Liefeld, "Consumer knowledge and use of country-of-origin information at the point of purchase," *Journal of Consumer Behaviour*, vol. 4, no. 2, pp. 85–87, 2004.
- [2] I. CarreñoCARREÑO and L. Medina PérezMEDINA Pérez, "Cool potatoes? Poland plans to introduce mandatory country of origin labelling for fresh potatoes," *European Journal of Risk Regulation*, vol. 10, no. 1, pp. 208–218, 2019.
- [3] K. Shaaban, A. Maher, and A. Singhapakdi, "Effect of vehicle safety recalls on the perception towards other vehicles from the same country of origin," *Journal of Traffic and Transportation Engineering*, vol. 6, no. 5, pp. 493–503, 2019.
- [4] W. J. Bilkey and E. Nes, "Country-of-origin effects on product evaluations," *Journal of International Business Studies*, vol. 13, no. 1, pp. 89–100, 1982.
- [5] P. W. Verlegh and J. B. E. Steenkamp, "A review and meta-analysis of country-of-origin research," *Journal of Economic Psychology*, vol. 20, no. 5, pp. 521–546, 1999.
- [6] N. M. Cakici and P. Shukla, "Country-of-origin misclassification awareness and consumers' behavioral intentions," *International Marketing Review*, vol. 34, no. 3, pp. 354–376, 2017.
- [7] A. Norris and J. Cranfield, "Consumer preferences for country-of-origin labeling in protected markets: evidence from the Canadian dairy market," *Applied Economic Perspectives and Policy*, vol. 41, no. 3, pp. 391–403, 2019.
- [8] A. Insch and E. Jackson, "Consumer understanding and use of country-of-origin in food choice," *British Food Journal*, vol. 116, no. 1, pp. 62–79, 2013.
- [9] J. Thøgersen, S. Pedersen, M. Paternoga, E. Schwendel, and J. Aschemann-Witzel, "How important is country-of-origin for organic food consumers? a review of the literature and suggestions for future research," *British Food Journal*, vol. 119, no. 3, pp. 542–557, 2017.
- [10] R. W. Semaan, S. Gould, C. H. Chao, and A. F. Groin, "'We don't all see it the same way': the biasing effects of country-of-origin and preference reversals on product evaluation," *European Journal of Marketing*, vol. 53, no. 5, pp. 989–1014, 2019.
- [11] J. Thøgersen, S. Pedersen, and J. Aschemann-Witzel, "The impact of organic certification and country of origin on consumer food choice in developed and emerging economies," *Food Quality and Preference*, vol. 72, pp. 10–30, 2018.
- [12] W. D. Hoyer, "An examination of consumer decision making for a common repeat purchase product," *Journal of Consumer Research*, vol. 11, no. 3, pp. 822–829, 1984.
- [13] A. Gerke, N. Chanavat, and M. Benson-Rea, "How can Country-of-Origin image be leveraged to create global sporting goods brands?" *Sport Management Review*, vol. 17, no. 2, pp. 174–189, 2014.
- [14] S. M. C. Loureiro and H. R. Kaufmann, "Advertising and country-of-origin images as sources of brand equity and the moderating role of brand typicality," *Baltic Journal of Management*, vol. 12, no. 2, pp. 153–170, 2017.
- [15] V. Bhat, "A gravity model for country of origin consumer evaluations," *International Journal of Applied Behavioral Economics*, vol. 8, no. 3, pp. 1–11, 2019.
- [16] A. Kimura, Y. Wada, D. Tsuzuki, S. I. Goto, and D. Cai, "Consumer valuation of packaged foods. Interactive effects of

- amount and accessibility of information,” *Appetite*, vol. 51, no. 3, pp. 628–634, 2008.
- [17] M. O’Donnell and E. R. K. Evers, “Preference reversals in willingness to pay and choice,” *Journal of Consumer Research*, vol. 45, no. 6, pp. 1315–1330, 2019.
- [18] A. Marchini, C. Riganelli, F. Diotallevi, and B. Polenzani, “Label information and consumer behaviour: evidence on drinking milk sector,” *Agricultural and Food Economics*, vol. 9, no. 1, pp. 8–24, 2021.
- [19] L. P. Lagasse, D. C. Love, and K. C. Smith, “Country-of-Origin labeling prior to and at the point of purchase: an exploration of the information environment in baltimore city grocery stores,” *Ecology of Food and Nutrition*, vol. 53, no. 1, pp. 58–80, 2014.
- [20] O. Joshi, N. C. Poudyal, and L. R. Larson, “The influence of sociopolitical, natural, and cultural factors on international tourism growth: a cross-country panel analysis,” *Environment, Development and Sustainability*, vol. 19, no. 3, pp. 825–838, 2017.
- [21] T. Aichner, P. Coletti, F. Jacob, and R. Wilken, “Did the volkswagen emissions scandal harm the “made in Germany” image? A cross-cultural, cross-products, cross-time study,” *Corporate Reputation Review*, vol. 24, no. 4, pp. 179–190, 2021.
- [22] B. Sevanandee and A. Damar-Ladkoo, “Country-of-origin effects on consumer buying behaviours. a case of mobile phones,” *Studies in Business and Economics*, vol. 13, no. 2, pp. 179–201, 2018.
- [23] J. Polfuß and D. Sönmez, “Country-of-origin as a dynamic concept: an analysis of Chinese consumer electronics brands in Germany,” *Journal of Chinese Economics and Foreign Trade Studies*, vol. 13, no. 3, pp. 115–138, 2020.
- [24] I. Fraser and K. Balcombe, “Wrapped in the flag: food choice and country of origin labelling,” *EuroChoices*, vol. 17, no. 3, pp. 37–42, 2018.
- [25] J. Kozáková and M. Urbánová, “Factors affecting educated Slovak millennials in consumption of fruit and vegetable,” *Studies in Business and Economics*, vol. 16, no. 2, pp. 142–156, 2021.
- [26] R. M. Potluri and S. Johnson, “An exploratory research on country-of-origin and its impact on the UAE consumers buying decisions,” *The Journal of Asian Finance, Economics and Business*, vol. 7, no. 9, pp. 455–466, 2020.
- [27] N. N. D. Phuong and N. T. Dat, “The effect of country-of-origin on customer purchase intention: a study of functional products in Vietnam,” *The Journal of Asian Finance, Economics and Business*, vol. 4, no. 3, pp. 75–83, 2017.