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Nutritional And Social Impact Of Artisanal Charcuterie, Compared To Industrial

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Abstract

The objective of this study is to determine the nutritional and social incidence of artisanal versus industrial charcuterie, through a sensory survey that allows identifying the factors that influence the change in consumer preferences. The research methodology is descriptive and transversal with a quantitative approach, based on pre-experimentation. The population consisted of 77 coffee shop owners in the cities of Ibarra, Otavalo, and Cotacachi. An accidental probabilistic sample was used; a survey consisting of 11 questions was applied using a 5-point Likert scale; likewise, the Expert Judgment Technique was used based on a pilot test of Combrach's Alpha reliability. The data obtained were analyzed through the application of descriptive and inferential statistics, SPSS version 25 was used, and the U-Mann Whitney test was applied to test the hypotheses. The relevant results are that artisanal sausages provide between 47 to 59 fewer calories than industrial sausages. It is concluded that artisanal sausages are healthier than industrial ones and that there is a preference on the part of consumers to purchase artisanal products, emphasizing their nutritional value over other indicators.

Keywords: *Artisanal sausages, ultra-processed products, consumer, nutrition.*

Resumen

El presente estudio tiene como objetivo determinar la incidencia nutricional y social de la charcutería artesanal frente a la industrial, a través de una encuesta sensorial que permiten identificar los factores que inciden en el cambio de preferencias del consumidor. La metodología de investigación es descriptiva trasversal con enfoque cuantitativo, sustentada en la pre- experimentación. La población estuvo conformada por 77 personas propietarios de cafeterías de las ciudades de Ibarra, Otavalo y Cotacachi. Se usó muestro probabilístico de tipo accidental; se aplicó una encuesta conformada por 11 preguntas utilizando escala de Likert de 5 puntos; así mismo, se utilizó la [1]Técnica de Juicio de Experto sustentada en una prueba piloto de confiabilidad Alfa de Combrach. Los datos obtenidos se analizaron a través de aplicación de estadística descriptiva e inferencial, se usó SPSS versión 25, se aplicó la prueba U-Mann Whitney para comprobar las hipótesis. Los resultados relevantes son que los embutidos artesanales proporcionan entre 47 a 59 menos calorías que los embutidos industriales. Se concluye que la charcutería artesanal es más saludable que la industrial, además que existe preferencia por parte de los consumidores a adquirir productos elaborados de manera artesanal destacando su valor nutricional por sobre otros indicadores.

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Palabras Clave: Embutidos artesanales, productos ultra procesados, consumidor, nutrición

Introduction

According to data from the FAO World Food Organization of the United Nations, in 2018 world meat production was estimated at 336.4 Mt, 1.2% more than in 2017. As a result, world meat production is expected to grow by almost 40 Mt by 2029 (FAO Food and Agriculture Organization of the United Nations, 2016).

On the other hand, the Federación Nacional de Ganaderos del Ecuador, the country generates 220,000 metric tons, resulting from the million cattle formally slaughtered which derives in 300 million pounds of meat (Líderes, 2015), data that demonstrate the high consumption of beef.

One of the most preferred foods because of their price and taste are sausages and they are part of the diet of children and adults (Teixeira, 2020). In 2018, the National Health and Nutrition Survey (Instituto Nacional de Estadística y Censos INEC, 2018) was applied in Ecuador, in which it was determined that children between 5 and 11 years old reached 35.4% of overweight and obesity.

Changes in eating habits affect the quality of life as diseases such as overweight and obesity appear: society is becoming accustomed to “ready-to-eat”, “heat-and-serve”, processed, packaged products and beverages sold by the retail trade. Latin America and the Caribbean (LAC) have gone from being agricultural areas with all kinds of natural foods to areas of consumption of processed and ultra-processed foods, changing the regional food system linked to overweight and obesity, which are problems that affect the world as a whole (Popkin, 2020).

In the food modernity, there is a tendency to look for alternatives of a more healthy food, less industrialized to take care of health. Taking as a basis that, the United Nations through the Food and Agriculture Organization (FAO, 2022) determined that 7.5% of children under 5 years of age in South America and the Caribbean were overweight by 2020, two percentage points more than the world average, on the other hand, obesity in adults, in the region, is 24.2% (FAO Food and Agriculture Organization of the United Nations, 2016) 13.1% more than in other regions.

Conceptual background

In the context of this study, it is important to review what processed and industrialized foods are. Processed foods are those whose natural state has been altered, for example, by freezing, dehydrating, grinding, canning, and mixing with other foods; foods to which salt, sugar, fat or other additives have been added also belong to this category (Popkin, 2020, p. 6).

According to the Dietary Guidelines Advisory Committee, 2010, the US Food and Drug Administration and Department of Health and Human Services (2011) are “any food that is not an agricultural commodity, including a variety of foods, from frozen vegetables, nuts, and canned beans, to whole grain bread, breakfast cereals, prepared foods, candy, and soft drinks” (p. 1).

On the subject of industrialized foods Izquierdo et al. (2020) defines them as “those processed by centralized food industries, with high volumes of production and regional or national distribution. They are usually easily accessible and are presented as frozen, ready to process, cook, heat or consume” (p. 4).

The same author explains the concept of modern industrialized food, which can be a single food or a combination of them; for example, “modified milk (powdered, skimmed, semi-skimmed, among others), breakfast cereals, whole wheat bread, salted wheat bread,

sausages, packaged sweet bread, modified oils and fats, solid-liquid sugars, soft drinks, baby products, and food supplements" (Izquierdo et. al., 2020, p. 4).

In that order of ideas, it is necessary to review what are ultra-processed foods, these, according to Monteiro (2019) are "formulations of ingredients, mostly of exclusively industrial use, typically created through a series of industrial techniques and processes" (p. 8). Ultra-processed foods (UPFs) designate a heterogeneous category of processed foods. UPF are highly processed preparations, to the point that their original plant or animal source is unrecognizable. Most of these foods are produced for immediate consumption or heating and serving. They do not require any preparation and are designed to be eaten quickly and easily (Popkin, 2020).

In recent years, the growing concern about the potential health risks associated with the consumption of UFP foods high in sodium and fat has led the meat industry to develop new formulations or modify traditional food products to contain less sodium and fat (Palavecino, 2017); therefore, the alternative of developing artisanal products whose importance lies in the fact that they contain a significant reduction of sodium and other salts is born.

In this sense, Iriarte (2012) states that "the processes of elaboration of artisanal products must be mostly manual (although it admits the use of mechanical and elementary technological means) and provides that such processes must be developed following the practice of good craftsmanship" (p. 147). These definitions vary in different regions and some cases are not found in regional legislatures, which makes it difficult for the consumer to determine which product in the market is handmade or which is simply industrial, which echoes this attribute to position itself.

> "Artisanal foods, sometimes treated as typical or traditional, without a clear distinction, are associated with a different food model, which is related to people's good health and a different quality of life, aspects for which they are considered better to eat than similar industrialized products¨ (Camacho, 2018, p. 12).

In the specific case of Ecuador, the general regulations of the law for the defense of artisans (1997) define artisanal activity as "that practiced manually for the transformation of raw materials destined for the production of goods and services with the aid of machines, equipment or tools, i.e., manual activity predominates over mechanized activity" (p.12). The sausages in this study are incorporated into the artisanal concept, the majority of the process is carried out manually; only meat grinders and sausage stuffers have been used as machinery.

Studies show that while consumption of processed foods in both Latin America and Europe has increased between 11% between 1990; 24% in 2000 and 31.7% in 2010, they are paralleled by increases in added sugars, from 8.4% of total energy in 1990, 11.2% in 2000 and 13% in 2010 (Monteiro et al., 2019, p. 17). It has even been found that the dietary proportion of ultra-processed foods and the incidence of depression show significant direct associations (Monteiro et al., 2019).

Unlike ultra-processed foods, handicrafts have a different logic than that of increasing profitability; they are contextualized to sustain the family units that produce them. Other authors approach handicrafts from a historical perspective as a process that involves social relations of production; It can also be approached from the political sphere, creating a legal framework to support the popular and solidarity economy; cultural, because it is motivated to recover ancestral and traditional practices of food handling, promoting the use of natural ingredients; and social, in terms of its impact on the change of eating habits, to improve the quality of life through healthy food.

The objective of this study is to determine the nutritional and social impact of artisanal versus industrial charcuterie utilizing a sensory survey to identify the factors that influence the change in consumer preferences.

Materials and Methods

This is basic research whose results broaden the knowledge about artisanal sausages; for this purpose, from a mixed approach, qualitative data referring to the contents of the book Smoked, Cured & Dried. The complete guide for meats and fish (Turan, 2015); likewise, comparative data on the nutritional composition of artisanal sausages versus industrial sausages are detailed. Finally, based on the empirical knowledge of one of the authors, 3 types of sausages were selected and elaborated: cured salami, cured pepperoni, and cured Spanish chorizo.

In order to obtain quantitative data, a questionnaire of 11 questions using the Lickert Scale was applied to 77 coffee shop owners in the cities of Ibarra, Otavalo, and Cotacachi, to obtain data on consumer preferences. The sample was calculated with a confidence level of 95% and a margin of error of 5.2%. For the validation of the instrument, the Expert Judgment technique was used, based on a pilot test; reliability was determined using the Combrasch Alpha coefficient.

In order to answer the incidence of consumer preferences based on price, brand, and nutritional value, dichotomous variables were used, in addition, in the four constructs, the Mann-Whitney U was applied as it is a non-parametric statistical procedure used because the random variable is ordinal.

This study determined the following hypotheses:

H0: The perception of price, brand, and nutritional value of industrial versus artisanal sausages is the same

H1: The perception of the price, brand, and nutritional value of industrial versus artisanal sausages is different.

Procedure

The recipe and the curing process of the sausages can be seen below.

a) **Processing**: Cured Salami

Table 1 Cured salami recipe and process

Raw Materials	Unit	Quantity
Pork fat meat (80% lean meat/ 20% fat meat)	g	1000
Beef Casing Caliber 45 mm	----------	----------
Salt	g	15
Prague salt N#1	g	4
Ground black pepper	g	7
Garlic powder	g	7
Red wine	g	50
Sugar	g	15

Procedure: A mixture of pork meat was selected for all samples in a proportion of 80% lean meat from parts such as the front shoulder of the pig and 20% lean meat from the pork belly. Add herbs, spices and sweeteners. Stuffing (natural pork and beef casings were used with the calibers mentioned in the ingredients).

Curing: They are wrapped, tied, and hung (in a controlled environment at temperatures between 5 and 7 degrees Celsius). Loss of humidity, the texture becomes firmer, weight and visual controls to determine the good condition of the product.

Drying: Drying time varied according to the weight loss recorded on a weekly basis and based on the weight loss guideline table in the Smoking, Curing, and Drying book (Turan, 2015, p. 29).

Drying control (sample):

Table 2 Drying control

Date	Weight	% loss
11/09/2022	309g	0%
11/29/2022	230g	25.56%
12/07/2022	201g	34.95%
12/13/2022	192g	37.13%

b) Processing: Cured pepperoni

Table 3 Cured pepperoni recipe and process

Raw Materials	Unit	Quantity
Pork fat meat (80% lean meat/ 20% fat meat)	g	2300
Beef Casing Caliber 45 mm	----------	----------
Salt	g	132
Cayenne pepper	g	15
Prague salt N#2	g	12
Fresh pepper	g	15
Ground aniseed	g	15
Corn syrup	g	60

Procedure: A mixture of pork meat was selected for all samples in a proportion of 80% lean meat from parts such as the front shoulder of the pig and 20% lean meat from the pork belly. Add herbs, spices and sweeteners. Stuffing (natural pork and beef casings were used with the calibers mentioned in the ingredients).

Curing: They are wrapped, tied, and hung (in a controlled environment at temperatures between 5 and 7 degrees Celsius). Loss of humidity, the texture becomes firmer, and weight and visual controls to determine the good condition of the product.

Drying: Drying time varied according to the weight loss recorded on a weekly basis and based on the table guidelines for weight loss from the Smoking, Curing, and Drying book (Turan, 2015, p. 29).

Drying control table (sample):

Table 4

Drying control

Date	Weight	% loss
11/16/2022	678 g	0%
11/23/2022	635 g	8 %
11/30/2022	589 g	14 %
12/07/2022	498 g	28 %

c) Procedure: Spanish Cured Chorizo

Table 5 Cured Spanish Chorizo Recipe and Process

Raw Material	Unit	Quantity
Pork fat meat (80% lean meat/ 20% fat meat)	g	4300
Beef Casing Caliber 45 mm	----------	----------
Salt	g	85
Cayenne Pepper	g	15
Prague Salt N#2	g	12
Paprika	g	50
Ground garlic	g	50
Red wine	g	200

Procedure: A mixture of pork meat was selected for all samples in a proportion of 80% lean meat from parts such as the front shoulder of the pig and 20% lean meat from the pork belly. Add herbs, spices and sweeteners. Stuffing (natural pork and beef casings were used with the calibers mentioned in the ingredients).

Curing: Wrapped, tied, and hung (in a controlled environment at temperatures between 5 and 7 degrees Celsius). Loss of humidity, the texture becomes firmer, and weight and visual controls to determine the good condition of the product.

Drying: Drying time varied according to the weight loss recorded on a weekly basis and based on the weight loss guideline table in the Smoking, Curing, and Drying book (Turan, 2015, p. 29).

Drying control (sample):

Table 6

Drying control

Date	Weight	% loss
11/16/2022	268 g	0%
11/23/2022	235,8 g	12 %
11/30/2022	212 g	21 %
12/07/2022	200 g	28 %
12/14/2022	179 g	33 %

Nutritional analysis

The nutritional analysis was performed on 1070 grams of product, in the case of artisanal sausages, an indirect method of calculation was used, through an online nutritional calculator, (CALCUONLINE, 2023). This in turn cites among the biographies used in its database: Clínica Universidad de Navarra. Medical dictionary. Kilocalories.

For the comparison with industrial sausages, products of the same category and recognized brands were identified in supermarkets in order to establish parallelism, and the nutritional composition detailed on the packaging was used. Table 7 shows the results obtained.

Nutritional composition of artisanal vs. industrial sausages

Table 7 Nutritional composition of artisanal vs. industrial sausages

Producto (1070 g)	Calories (kcal)	Total Fats (g)	Sodium (mg)	Carbohydrates (mg)	Proteins (g)
Artisanal Salami	1579,06	66,16	7057,48	18,97	205,35
Salami (Industrial)	3210	178,33	24966,7	35,7	321

Diff % Diff % Diff % Diff	-50,8	-62,9	-71,7	-46,8	-36,0
Peperoni	1576,98	66,41	22527,58	25,87	204,16
Peperoni (Industrial)	2996	235,4	14338	0	214
Diff % Diff	-47,4	-71,8	57,1	0,0	-4,6
Cured Chorizo	1525,89	68,16	12234,91	8,86	10,31
ChorizoCured (Industrial)	3745	267,5	17387,5	53,5	294,25
Diff % Diff	-59,3	-74,5	-29,6	-83,4	-96,5

In the nutritional analysis of the artisanal sausages, although the amount of nitrites is close to industrial levels, the use of other additives such as benzoates and sodium polyphosphate is not present; likewise, no types of flavor enhancers such as monosodium glutamate or food coloring are used, since the aim is to preserve the essence of the raw material. Some ingredients such as non-sodium glutamate in moderate amounts do not have a negative effect on human health, although the results are not conclusive.

Results and discusión

The recent development of artisanal products as a differentiating factor compared to similar products made industrially tends to emphasize their healthy aspect concerning their industrial counterparts by having fewer or no additives in their composition.

> Artisanal foods, sometimes treated as typical or traditional, without a clear distinction, are associated with a different food model, which is related to people's good health and a different quality of life, aspects for which they are considered better to eat than similar industrialized products (Camacho-Vera, 2019, p. 12)

In recent years, growing concern about the potential health risks associated with the consumption of foods high in sodium and fat has led the meat industry to develop new formulations or modify traditional food products to contain less sodium and fat (Palavecino N. Z., 2021). In this sense, artisanal sausages provide a significant reduction in sodium and other salts.

This research is aligned with Sustainable Development Goals 3 Health and Wellbeing, since one of its goals is to “By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution” (UN, 2019, para. 1); likewise, this study promotes the production and consumption of artisanal sausages, with the aim of avoiding complications in health.

With SDG 12, Responsible Consumption and Production, this study promotes “Sustainable consumption and production is about doing more and better with less. It is also about decoupling economic growth from environmental degradation, increasing resource efficiency and promoting sustainable lifestyles” (UN, 2019, para.1); for such reason, the production and consumption of artisanal sausages versus ultra-processed food, will improve the quality of life of the users of the cafeterias in the cities of Ibarra, Otavalo and Cotacachi and their stakeholders.

The results obtained from this study contribute to the generation of information on alternatives to industrialized food, as well as to know the preferences of consumers when choosing to change their eating habits.

From the results obtained, it can be observed that artisanal sausages provide between 47 and 59 fewer calories than industrial sausages, which is directly related to the amount of

total fat; less fat implies fewer calories produced, which may be due to the mixture of 80% lean meat and 20% fatty meat in the sausage. Industrial sausages usually used.

List of other additives used in industrial sausages

Table 8 Other additives used in industrial sausages

Type	Detail	Additives
Pepperoni	Sodium lactate	Preservative
	Monosodium glutamate	Flavor enhancer
	Sodium erythorbate	Antioxidant
	Sodium nitrite	Preservative (curing agent)
Chorizo	Potassium nitrite	Preservative (curing agent)
Cured	Sodium nitrite	Preservative (curing agent)
	Ascorbic acid	Antioxidant
	Maltodextrin	Thickener
	Sodium polyphosphate	Stabilizer
Salami	Maltodextrin	Thickener
	Skim milk powder	
	Sodium polyphosphate	Stabilizer
	Ascorbic acid	Antioxidant
	Potassium nitrite	Preservative (curing agent)
	Sodium nitrite	Preservative (curing agent)
	Lactic culture	

Chemical and nutritional hazards of ultra-processed foods

Table 9 Chemical and nutritional hazards of ultra-processed foods

Additive	Detail
Sodium nitrite and potassium nitrite	These are associated with nausea, dizziness, vomiting, vertigo, muscle weakness, headaches, deoxygenation of the blood, irregular pulse, hypertension, and collapse of the circulatory system. They form nitrosamines (Roncancio, 2015) in the stomach, which have been shown to cause cancer, produce gastroenteritis with great pain in the stomach (Velázquez, 2012)
Monosodium glutamate	Monosodium glutamate could influence the hypothalamic regulation of appetite, favoring a high consumption of foods containing it (Carreño, 2013). It can cause the so-called “Chinese restaurant syndrome” that produces heart palpitations, headaches, dizziness, fainting, muscle stiffness, nausea, weakness in the upper extremities, neck pain, and migraine-like symptoms (Velázquez, 2012).
Saturated fats	Increased cholesterol levels. Increase in postprandial lipemia. Population correlation studies have shown that increasing the consumption of saturated fats increases mortality due to ischemic heart disease in entire populations (Bejarano, p. 53).
Sodium and other sources (sodium polyphosphate, sodium erythorbate)	However, it should be noted that there are other sources, such as monosodium glutamate, contained in soy sauce and also in other food additives, such as sodium benzoate, sodium nitrate, and sodium pyrophosphate (SAIEH, 2015). The influence of excess sodium and deficit of potassium, characteristic of our diet, in the development of hypertension. The direct relationship between higher sodium

	intake and elevated blood pressure values is demonstrated in several studies, highlighting the INTERSALT, (Zarate, 2012).

As can be seen in Table 7, the amount of fat in artisanal sausages ranges from -62.9 to -74.5 less than in industrial sausages, which limits the problems mentioned in Table 8 related to fats, only total fats have been taken into account, not trans fats, the case of sodium also shows a lower percentage amount in the salami -71.7, and in the -29, 6 The only case in which more sodium was used was in the pepearon, since the curing process required more time and since no other additives were used, such as sodium polysphosphate and sodium erythorbate, which were found in the industrial products, their use was necessary, and it can be noted that these other additives are present in the industrial products, adding to the sodium concentrations and the problems derived from their high consumption (Table 9). Artisanal sausages do not have monosodium glutamate, or any type of flavor enhancer. In the case of sodium and potassium nitrites, the difference can be seen in Table 10.

Differences between Nitrites and Nitrates

Table 10 Nitrite and nitrate differences

*1000 g	Artisanal salami	Artisanal Pepperoni	Artisan cured sausage	08.2.1.1 Processed cured (including salted), dried and not heat-treated meat, poultry and game products, in whole pieces or in cuts (FAO/OMS, 2017)	Requested: 420 DM (mg/kg) GTE: adopt to 250
Sodium nitrite	0.23	0.25	0.16	0.25	
Potassium nitrite		0.19	0.1		
Totals	0.23	0.44	0.26		
Diff %	-0.02	0.19	0.01		

In the case of nitrites and nitrates, they are within the established limits, although as shown in Table 10, a greater margin for their use has been requested. This applies to sausages such as pepperoni, which requires maturation and a longer drying time since no other preservative additives are used.

Consumer preferences

Rodríguez (2013) establishes that consumer preferences are a function of the utility that rationalizes consumer choices continuously, i.e., behavior can be manifested as a function of income and other foreseeable socio-economic elements, factors that can motivate or inhibit the decision to consume a given product. Consequently, demand is considered to represent the quantity that a consumer wishes to purchase of a series of goods, considering his preferences in terms of price, brand, nutritional value, taste, etc.

Importance of industrial sausage preference

Table 11 Preference for industrial sausages

		Responses N	Percentage	Percentage of cases
Industrial sausage factors[a]	What is the most important aspect in the purchase of an industrial sausage?	24	12.1%	34.8%
	From the brand What is the most important aspect in the purchase of an industrial sausage?	27	13.6%	39.1%
	What is the most important aspect when buying an industrial sausage?	54	27.1%	78.3%
	What is the most important aspect of nutritional value when buying an industrial sausage?	43	21.6%	62.3%
	What is the most important aspect in the purchase of an industrial sausage?	51	25.6%	73.9%
Total		199	100.0%	288.4%

a. Dichotomy group tabulated in value 1.

From a sample of 77 people, a total of 199 responses were obtained. 27.10% of the respondents report that taste is the most important factor in an industrial sausage. Considering the percentage of cases, at least 78% of the people, what matters most to them is the taste.

Importance of the preference for artisanal sausages

Table 12 Preference for handmade sausages

		Responses N	Percentage	Percentage of cases
Multiple_EMB_ART_Variables[a]	What is the most important aspect of the price when buying an artisanal sausage?	29	14.6%	43.9%
	From the brand What is the most important aspect in the purchase of an artisanal sausage?	21	10.6%	31.8%

	What is the most important aspect of the quality of the raw material when purchasing an artisanal sausage?	58	29.3%	87.9%
	What is the most important aspect in the purchase of an artisanal sausage?	56	28.3%	84.8%
	What is the most important aspect of the presentation when buying an artisanal sausage?	34	17.2%	51.5%
Total		198	100.0%	300.0%

a. Dichotomy group tabulated in value 1.

From a sample of 77 people, a total of 198 responses. 29.30% of the respondents report that the quality of the raw material is the most important factor in an artisanal sausage. Considering the percentage of cases, at least 87.9% of the people, what matters most is the quality of the raw material.

Hypothesis testing

It can be noted that the logic of artisanal food is not based on the logic of maintaining lower costs, as our study shows that the raw material is of greater value, but to seek a differentiation, in this regard Vera comments on industrial food both its production and its transformation have been adjusted to the logic of economic rationality of the capitalist enterprise, under which it is to reduce costs and increase profit at all costs (Vera, p.11).

Table 13 Summary of parametric tests

Non-parametric test Significance level Confidence level Results	**Mann Whitney U**		**Decision**
H1. The perception about the price of industrial versus artisanal sausages is different	**Test statistics[a]**		Rejected
		PriceIND_ART	
	Mann-Whitney U	2746,500	
	W for Wilcoxon	5749,500	
	Z	-,817	
	Asymptotic sign(bilateral)	,414	
	a. Grouping variable: Group		
H2. The perception of the nutritional value of industrial versus artisanal sausages is different	**Test statistics[a]**		Accepted
		Nutri_IND_ART	
	Mann-Whitney U	2440.000	
	W for Wilcoxon	5443.000	
	Z	-2.242	

	Asymptotic sign(bilateral) .025	
	a. Grouping variable: Group1	
H3. Brand perception of industrial versus artisanal sausages is different.	Test statistics Marca_IND_ART Mann-Whitney U 2760.000 W for Wilcoxon 5763.000 Z -.760 Asymptotic sign(bilateral) .447 a. Grouping variable: Group3	Rejected
H4. The perception of the taste of industrial versus artisanal sausages is different.	**Test statistics**[a] Sabor_IND_ART U de Mann-Whitney 2847.000 W de Wilcoxon 5850.000 Z -.533 Sig. asintótica(bilateral) .594 a. Variable de agrupación: Grupo4	Rejected

It can be noted that the logic of artisanal foods is not a function of maintaining lower costs; the study shows that consumer preferences regarding price are the same in the case of the artisanal product and the industrial product, however, there is a different appreciation, since the nutritional value of the artisanal product is highlighted; in this context "industrial foods, both their production and their transformation have been adjusted to the economic rationality of the capitalist enterprise, under which it is about reducing costs and increasing profit at all costs" (Camacho, 2019, p. 11).

When choosing between artisanal and industrial sausages, consumers see nutritional value as more relevant than price, brand, and flavor; with these results, hypothesis 1 is accepted: **H1:** The perception of price, brand, and nutritional value of industrial versus artisanal sausages is different.

Conclusions

Artisanal charcuterie is healthier than industrial charcuterie, and consumers prefer to buy artisanal products, emphasizing their nutritional value over other indicators.
Artisanal sausages provide 47 to 59 fewer calories than industrial sausages, which is directly related to the amount of total fat; less fat means fewer calories produced.

With respect to consumer preferences, the most important factor in an industrial sausage is the flavor, while the raw material is more relevant when choosing artisanal sausages.

Nutritional value takes precedence over other indicators such as price, brand, and flavor when choosing between artisanal and industrial sausages.

When choosing between artisanal and industrial sausages, consumers consider the nutritional value to be more important than price, brand, and flavor.

Recommendations

Raise community awareness about the damage caused by the consumption of ultra-processed foods, through campaigns sponsored by the Ministry of Public Health and the National Agency for Regulation, Control and Health Surveillance (ARCSA).

Socialize the information obtained with the owners of cafeterias in Ibarra, Otavalo, and Cotacachi in order to motivate associativity and take advantage of the benefits of the Popular and Solidarity Economy to create a brand of healthy sausages taking into account consumer preferences.

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