ACCEPTABILITY IN THE OPTIMAL FORMULATION OF CHRYSIN WITH PARTIAL REPLACEMENT OF PITUCA FLOUR

Pervis Paredes
National University Federico Villarreal, (Peru).
E-mail: pparedes@unfv.edu.pe ORCID: https://orcid.org/0000-0002-7186-9614

Doris Esenarro
National University Federico Villarreal, (Peru).
E-mail: desenarro@unfv.edu.pe ORCID: https://orcid.org/0000-0002-7186-9614

Jannina J. Bernabe
National University Federico Villarreal, (Peru).
E-mail: jbernabe@unfv.edu.pe ORCID: https://orcid.org/0000-0002-7186-9614

Wilber Quispe
National University Federico Villarreal, (Peru).
E-mail: wquispe@unfv.edu.pe ORCID: https://orcid.org/0000-0002-7186-9614

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ABSTRACT

The aim of this research is to determine the acceptability of chrysin with the partial replacement of pituca flour by protein intake. The methodology applied was based on a quasi-experimental design and the ingredients used for the research were foods with a high nutritional percentage that are pituca flour (16.36%) and wheat flour (47.27%), margarine (5.45%), white sugar (5.45%), water (25%) and yeast (0.09%). The results obtained through the descriptive test in which the results of 20 panelists were collected, the data were evaluated through the MINITAB and SPSS programs. The number of formulations and at the same time the prognosis of ingredient behaviour was determined by a Taguchi chart. The acceptability of chrysin was determined by microbiological studies and physicochemical analyses obtained, which resulted in no differences from the product, but if they are within the parameters required by the standard, the percentage of proteins was also checked.

KEYWORDS

Chrysin, Pituca, Quinoa, Descriptive test, Yeast, Optimal, Variation, Texture, Range.

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1. INTRODUCTION

The advance of scientific knowledge confirms every day that the correct nutrition, fruit of an adequate nutrition, is one of the determining factors in health. A healthy diet, which maintains constant the composition of the tissues, which allows the functioning of devices and systems, which guarantees the reproduction and which gives the individual a state of well-being that leads him to the activity, is the one that fulfills four fundamental laws; that is: the law of quantity, quality, harmony and adequacy (Bustos & Marapara, 2016). However, the nutritional recommendations, the progress of technology, the availability and access to food, do not allow by themselves, the population to adopt adequate forms of life and food. The food of today's society is highly influenced by the daily habits that are implemented in many occasions as a result of the pace of life it imposes. In Peru due to biological diversity, there are many varieties of fruits with many properties for health care, that is why this fruit called pituca has been chosen, for its physical and chemical characteristics, the dietary patterns incorporated mainly in urban areas condition the choice of processed foods with low nutritional value, low fiber content, high percentages of saturated fats, refined sugars, additives, preservatives (predominantly sodium) and high caloric value. This situation predisposes to the development of certain diseases that arise as a result of an unhealthy diet: obesity (Alvarado *et al.*, 2020), malnutrition, dyslipidemia, high blood pressure and cardiovascular disease, among others. This research aims to develop a change in bakery products, the replacement of wheat flour (traditional in the preparation of bread) by pituca flour (colocasia esculenta) in the chrysin is considered, since colocasia esculenta has greater nutritional properties wheat and its composition manages to adapt to heat treatment to extract flour from it (Cerón *et al.*, 2011) .

Chrysin becomes one of the preferred options and can be considered a food for mass consumption. The pituca would play an important role in food, rich in minerals and carbohydrates beneficial to health. (Torres & Montero, 2014). In our country it can be found profusely in areas of the jungle, although its consumption at a local level is only observed in Amazonian populations, especially in native populations or those who have knowledge of its digestive use, but the rest of the country, unknown this tuber, its properties and uses (Quispe *et al.*, 2020).

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2. METHODOLOGY

This research was carried out at the Federico Villarreal National University physicochemical and microbiology laboratory, where the drying process of the pituca was carried out in order to extract the flour that would be used to produce the croutons de aljonjolí. For the preparation of chrysins, the laboratory of the company Exandal S.A.C. where innovations in flour products were previously developed from germ, tare, etc. The quantity in percentage of ingredients to be used is detailed.

Table 1. Control chrysin ingredients, chrysin with partial replacement.

Ingredients (g/100g)	Chrysine control (0%)	Optimum chrysin (30%)	Percentage average
Water	27.50	27.50	25.00%
White Sugar	6.00	6.00	5.45%
Margarine	6.00	6.00	5.45%
Yeast	0.10	0.10	0.09%
Sesame	0.40	0.40	0.09%
Pituca Flour	12.00	18.00	16.36%
Wheat flour	58.00	52.00	47.27%

Table 1 shows the inputs for the preparation with their respective portions and their percentage of participation for the preparation.

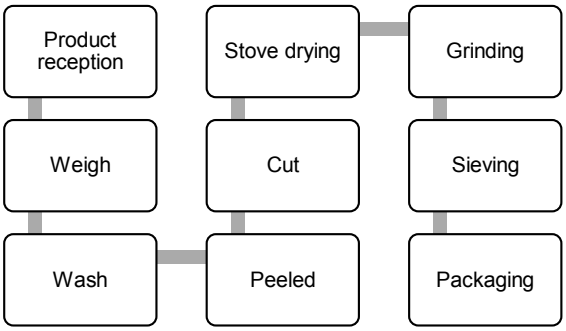

Figure 1. Flow chart for obtaining pituca flour.

In the Figure 1 It can see the sequence First stage: Obtaining pituca flour (colocasia esculenta), as well as the processes established in each stage.

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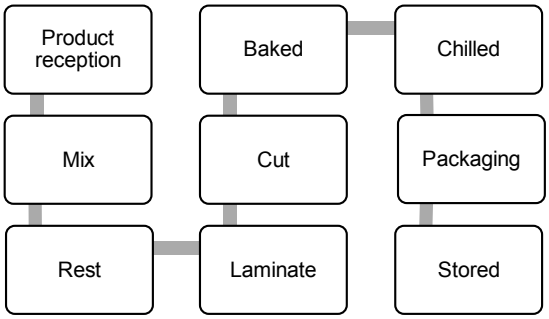

Figure 2. Flow chart for obtaining chrysin with pituca flour replacement.

In the Figure 2 It the second stage: Preparation of sesame seeds with the optimal formulation (colocasia esculenta).

Third stage: Sensory evaluation of the chrysin with optimal formulation.

It was carried out with 20 panelists in a 5-level Hedonic scale. Fourth stage: Physical-chemical and microbiological analysis of the chrysin with optimal formulation.

The optimal formulation will be analyzed from NTS N to 071-minsa / digesa-v.0.1.

The instrument used for data collection was Groove & Alvarado's (2016) thesis to apply for the title of food engineer.

3. RESULTS

The results obtained from the development of the tests carried out during the elaboration of the product in the laboratory carried out are detailed below.

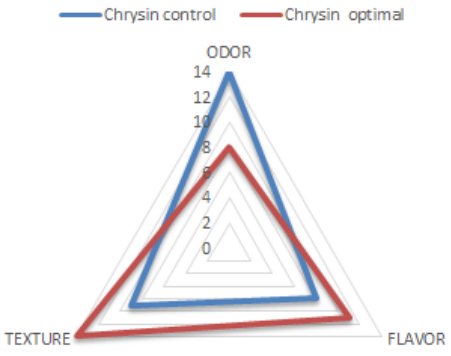

Figure 3. Sensory analysis results with panelists.

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The Figure 3 shows a graph with their respective characteristics such as texture, odor, flavor obtained from elaborated tests.

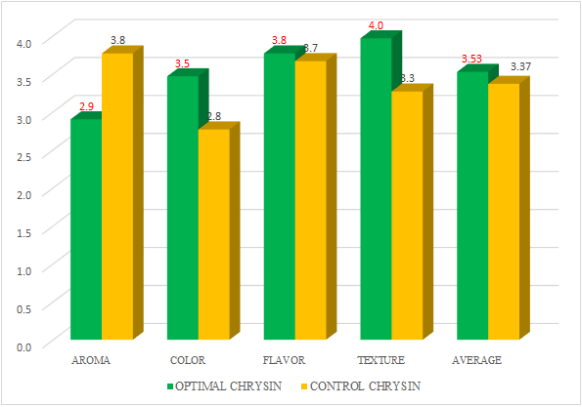

Figure 4. Sensory analysis results with panelists.

As can be seen in Figure 3 the optimum chrysinum compared to the chrysinum control has a better taste, colour and texture than the average control or chrysinum control (in this case based on wheat flour only).

3.1. RESULTS OF THE PHYSICO-CHEMICAL ANALYSIS

Table 3. pH analysis results.

	Test value = 7,45					
	t	gl	Sig. (bilateral)	Difference of means	95% confidence interval of difference	
					lower	higher
pH	-,736	4	,503	-,17000	-,8116	,4716

In the pH analysis, Table 3 statistically it turns out that the results obtained do not differ significantly from the parameter in which p> 0.05, therefore, the null hypothesis is rejected for having obtained results within the limits.

Table 4. Protein analysis results.

	Test value = 12					
	t	gl	Sig. (bilateral)	Difference of means	95% confidence interval of difference	
					lower	higher
Protein	-1,125	4	,323	-,05600	-,1942	,0822

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In the analysis of the proteins Table 4 statistically it turns out that the results obtained to the parameter do not differ significantly, therefore the null hypothesis is rejected for having obtained results within the limits.

Table 5. Results of ash analysis.

	Test value = 3					
	t	gl	Sig.(bila-teral)	Difference of means	95% confidence inter-val of difference	
					lower	higher
Ash	-122,275	4	,000	-1,16000	-1,1863	-1,1337

In the analysis of the ash Table 5 statistically it turns out that there are significant differences the results obtained to the parameter in which <0.05, therefore the null hypothesis is accepted since it is not in the primitive limits.

3.2. RESULTS OF THE MICROBIOLOGICAL ANALYSIS

Table 6. Results of the microbiological analyzes.

Essays	Optimal formulation	Limits ntp 206.001:2016	
		Min.	Max.
Moulds (UFC/g)	59x10	10x2	10x3
Escherichia coli (UFC/g)	< 3	3	20
Salmonella sp.	**Absence /25g**	**Absence /25g**	
Mesophilic aerobes (CFU/g)	24x10-2	10x4	10x5

In Table 6 you can see the results obtained from the microbial analyzes, having as the optimal results required as shown by the data.

4. DISCUSSION

The results of the acceptability of the chrysins are comparable to other non-traditional products (Cerón *et al.*, 2011) since in the production of cookies with pituca flour it indicates that in the flavor, the odor is not demonstrated differentiation, being accepted by the panelists.

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The reports of the Lima-Metropolitan Association (Hleap-Zapata, Burbano-Portillo, & Mora-Vera, 2017) show that snacks (corn sticks, chips, sweet potatoes, etc.) in Lima are highly consumed, which means that there is a 30% excess of consumption of these, being the main cause of obesity (Carranza *et al.*, 2020).

Although most of the baby foods in the lunch box are cookies, crackers and some bakery products, within the first 10 consumptions of regular diet, this study was conducted to bring a not new product, but with changes in its ingredients by enriching it with pituca and wheat flour, and encourage the production of these in various bakery products (Meng et al, 2017; Correia, Soares & Brites, 2017).

5. CONCLUSIONS

Pituca fruit as an excellent food for athletes or people who do some physical work, because it provides a lot of energy, but above all, it is vital as food for children, especially babies in their bone and dental stage, so its use is important (Umo & Alabi, 2016).

The partial formulation of optimal chrysin is accepted, with the results of the sensory, physicochemical and microbiological analysis it is concluded that the product is adequate and has the quality characteristics to perform its commercialization.

Finally, another study obtained as a result in the sensory analysis performed on extruded snacks (quinoa flour, sweet potato flour, and tarwi flour) coated with a 50 ° Brix honey solution, determined that there is no significant difference between the level to please the 16 formulations (Pérez, Elías, & Delgado, 2017).

The incorporation of a new drink with healthy characteristics and with a unique product on the market, makes it more likely that consumers can have alternatives to choose from their diet for their charity (Quispe *et al.*, 2020).

The addition of quinoa flour if it affects the sensory acceptability of the product according to the S / R determines that the higher the amount of quinoa flour shows lower the acceptability of the product.

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