Semestre Económico (2023), 12(1), 27–37
10.26867/se.2023.v12i1.142
http://semestreeconomico.unap.edu.pe/index.php/revista/index
ISSN: 2072-0572 (Versión impresa) **ISSN: 2523-0840 (Versión digital)**

ARTÍCULO ORIGINAL

Factors influencing organic quinoa consumption preferences in households in the city of Puno, 2020

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(Recibido 05 de octubre de 2022; aceptado 15 de marzo de 2023)

Abstract

The purpose of this research is to determine the factors that influence the preferences for the consumption of organic quinoa in the households of the city of Puno. The present work has a quantitative, applied type, with a non-experimental, cross-sectional and explanatory design; the population is composed of 127 heads of household in the city of Puno; likewise, simple random sampling was used as a probability sampling procedure. The data collection instrument was a questionnaire with 17 questions, some of which were closed and others open-ended. For the estimation, a logit econometric model was applied, and subsequently the marginal effects were estimated, obtaining the following results: The variable of age, family income, knowledge of the benefits of organic quinoa, household size, perception of the benefits of organic quinoa, household size, the health and price perception have a positive influence on the probability of preference for quinoa consumption of organic quinoa in households in the city of Puno. In other words, if the age of the head of household, household income, knowledge about the benefits of organic quinoa, household size, health perception and price perception increase, and price perception, the probability of preference for organic quinoa consumption in households in the city of Puno increases by 0.76%, 0.01%, 0.01%, 0.01% and 0.01%, respectively, while the other variables do not influence the probability of organic quinoa consumption in households in the city of Puno, likewise the perception of health and perception of the price of organic quinoa by consumers have a greater impact on the probability of organic quinoa consumption in households in the city of Puno with a value of 57.91% and 41.46% respectively.

Keywords: quinoa organic, consumption, model logit.

1. Introduction

This research article entitled "Factors that influence the consumption preferences of organic quinoa in households in the city of Puno 2020" is of utmost importance, since within the organic products in Peru, quinoa is one of the most sought-after foods in the international market, belongs to the agricultural sector and is considered a source of income for GDP growth. For its part, MINAGRI (2017) indicated that quinoa is among the 10 most exported products in the world and it was estimated that in 2018 there were 51 thousand tons of production. The highlands are mainly characterized by organic quinoa production crops, although with lower yields. FAO considers quinoa as part of the World Agricultural Heritage Systems (GIAHS), and the World Health Organization considers it as the food of the future, since no chemicals are used and the cost exceeds that of conventional quinoa. On the other hand, the declarations of the UN in 2013 as the "International Year of Quinoa" was an essential cause for the increase in quinoa consumption, since it has encouraged the knowledge of its

beneficial properties, its diversity and its use in attempts to eliminate hunger and malnutrition, so it contributes to have a food security strategy for future generations (Food and Agriculture Organization of the United Nations [FAO], 2011). For this reason, organic quinoa is a versatile product with high nutritional content.

On the other hand, buyers generate predilections among the other available products, in a scenario where there may be zero quantities of products or where there are other quantities of goods, buyers will tend to choose among them if they need to. (Pindyck, 2009).

Likewise, Muñoz (2014), in his research work, identified quinoa as one of the most complete foods, which is consumed by people whose purpose is to improve their diet and preserve their health; in addition to this, the results obtained by the surveyed describe that 64% consider that its consumption responds to cultural reasons of the area and a search to restore the value of the consumption of native foods.

While García (2016) in his research concluded that the variables that explain the consumption of quinoa in households in the city of Puno, in addition to the perception of health and perception about nutrition, are also positively explained by the variable number of household members and income level, while the variable age and gender of the consumer do not condition the quinoa consumption.

Ku (2019) in his study found that 72.73% of the people consulted identify the relationship of dependence between the consumption of quinoa and care for the environment by the main exporting entities from Peru to destination countries during the years 2013 - 2018.

However, according to Chata (2017), in his study, he concluded that in 2014, in the highlands, there was less consumption of quinoa, an average of 13.5 kg; similarly in the coastal and jungle region has consumption decreased to 11.6 Kg. and 11.2 Kg. for the same year. It has also been concluded that quinoa consumption is explained by income variable, that is, as income increases, quinoa consumption increases by 6.7% over consumption, given a 1% in the family income.

Furthermore, Mujica (1993) (cited in López, 2018) argues that organic quinoa is a product of natural origin, made from cheap vegetable proteins, and its high proportion of essential amino acids, it has a high nutritional value, being milk and eggs staple foods for consumers. It also has a higher caloric value than other cereals, reaching 350 kcal/100 g both in grain and flour, a suitable food for cold regions and seasons (Apaza & Delgado, 2005).

Regarding the factors that determine the demand for organic food, in consumers, Bermejo (2018) in his research found an increasing rate of consumption with respect to the increase in the age of the people, so we have that for 1 year of age that increases the consumer, increases by 0.7% the probabilities of consuming organic products, it is also observed that an increase of S/.1000 per month increases the probability of consuming organic products by 12.7%. On the other hand, it is obtained that a male consumer decreases the probability of consuming organic products by 15.9%.

Ayala (1999) (cited in Hinostroza, 2013) presents an approach to the consumption and use of quinoa for the entire population using the title "Use of quinoa in marginalized populations" and states that the consumption of the quantity and quality of food depends on many interrelated factors, one of them is the availability of food and the others are: income levels and food purchasing capacity, household size, education, training and the knowledge extension about food.

On the other hand, Rojas (2014) in his study from a rational approach, concluded that the factors that influence the consumption of organic quinoa are the contribution to health improvement (35%), they are healthier foods (34%), they are foods that are free of any industrial agrochemicals (23%) and that it is a good quality organic product (12%).

Neira & Londoño (2019) tell us about the perception that they have regarding the environment and the perception of health, which have a positive influence on consumption preferences for organic products consumption of organic products.

In short, from the point of view of demand, the market for quinoa and its derivatives appears to be safe, and it is necessary to promote measures, that contribute to national and international growth, in order to limit the probability of a fall in price levels, for which public policies should be promoted and

developed to increase consumption levels internally and externally. (FAO AND ALADI, 2014).

For this reason, the objective of this research is to identify those factors that influence the choice of organic quinoa by the citizens of Puno, so the information obtained can be used for the design of strategies to increase the levels of feeding with organic quinoa in the country.

2. Materials and methods

The research work is quantitative and non-experimental. The population has been taken as a reference to the projected population of the city of Puno for the year 2020 (Instituto Nacional de Estadistica Informatica [INEI] (2019); which amounts to 142,691 inhabitants. In addition, the sample was used by means of simple random sampling. Where subsequently, a sample size of 127 heads of household has been obtained. The instrument used in the research work was of a multiparity questionnaire with 17 open and closed questions on consumption variables and socioeconomic factors. For the estimation, an econometric logit model was applied, and subsequently the marginal effects were estimated.

2.1 Detailed description by specific objectives

i) In relation to the first objective

For the first regression, logit models will be used, where the dependent variable is a dummy, it only takes two values 1 (consumes) and 0 (does not consume), where the probability of consumption of organic quinoa is estimated:

$$P = Prob = \frac{1}{1 + e^{-z}} = \frac{1}{1 + e^{z}} \tag{1}$$

Where: e = is the base of the neperian numbers, P is the probability that the event occurs. And z is given by:

$$z = ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + ... + \beta_k X_k \tag{2}$$

Donde:

Y = dependent variable

p = represents the probability that the representative of each household that has a preference for consuming organic quinoa (if consumed)

$1 - p$ = will be the probability that the representative of each household that has a preference for consuming organic quinoa (does not consume)

$X_1, X_2, X_3, ..., X_k$ Explanatory variables of the model $\beta_1, \beta_2, \beta_3, ..., \beta_k$ Model parameters. The The variable Y, reflects the occurrence or non-occurrence of an event and is dichotomous in nature, which can assume the following two values:

$$Y = \begin{cases} 1 & \textit{Has preference to consume organic quinoa} \\ 0 & \textit{No consumer preferences} \end{cases} \tag{3}$$

In order to determine the preferences for organic quinoa consumption, we have included variables of: age, knowledge of the benefits of organic quinoa, family income, marital status, household size, environmental perception, health perception and price perception. Once the variables have been determined, the model follows the following specification:

$$P(Y = 1) = ln\left(\frac{p = consume}{1 - p = no\ consume}\right) = \beta_0 + \beta_1 EDAD + \beta_2 INGF + \beta_3 CONOCIMIENTO + \beta_4 ESTCIV$$

$$+\beta_5 TH + \beta_6 PAM + \beta_7 PSAL + \beta_8 PPRECIO \quad (4)$$

Table 1. Operacionalization of variables

Variables	Type of variables	Description	Codification
Dependent variables			
Consume	Dichotomous variable	PQuinoa consumption preferences organic.	1=Sif consuming 0=Does not consume
Independent variables			
Age	Discrete variable	Consumer's age	
Knowledge of the benefits of organic quinoa	Dichotomous variable	The knowledge about organic quinoa	1=Aware of the benefits of organic quinoa 0=Not aware of benefits of organic quinoa
Family income	Discrete variable	Family income	
Marital status	Dichotomous variable	Marital status	1=Married, partner 0=Single
Household size	Discrete variable	Household size	
Perception of the environment	Dichotomous variable	Perception that the consumption of organic quinoa cares the environment	1=Yes 0=No
Health perception	Dichotomous variable	Perception of the consumption of organic quinoa improves health	1=Yes 0=No
Perception of price	Dichotomous variable	Perception of the price of organic quinoa is fair	1=Yes 0=No

Source: Own elaboration

ii) With reference to the second objective

The variables that have the greatest impact on the consumption of organic quinoa were determined, the analysis of the marginal effects of the variables will be carried out through the derivatives of the estimated model with respect to the independent variables, which is described as the change in the probability of change in the explanatory variable, according to Eberechkwu, Jason, & Rahul (2014) the expression used in the logistic regression is shown in the following equation:

$$EM = \frac{\partial y}{\partial x_i} = \frac{e^{-z_i}}{1 - e^{-(\beta_0 + \sum_{i=0}^{n} \beta_i x_i)}} \quad (5)$$

Where:

$\frac{\partial y}{\partial x_i}$ = Partial derivative of the dependent variable

$z_i = \beta_0 + \sum_{i=0}^{n} \beta_i x_i$

β_0 Regression constant

$\sum_{i=0}^{n} \beta_i x_i$ Sum of the products of the coefficients and the independent variables

$i = 1, 2, 3, ..., 15.$

3. Results and discussion

Table 2. Organic quinoa consumption preferences according to age

Probability of consumption organic quinoa	mean	Standard deviation	Minimum	Maximum
No	35	9.88	19	68
Yes	54	14.99	23	81

Source: Own elaboration

It is observed that the average age of people who prefer to consume organic quinoa is 54 years old, with the range varying between 19 and 68 years. The heterogeneity of ages is low in a proportion of 14.99, being the majority group.; these conditions demonstrate that older people have a greater preference for the consumption of organic quinoa. In this sense, and because of the benefits in health

is one of the main reasons why consumers prefer organic products, it is reasonable to identify that older adult present more latent health problems than younger ones, which is a central element for their consumption.

Table 3. Preferences for organic quinoa consumption according to knowledge

Probability of consumption organic quinoa	mean	Standard deviation	Minimum	Maximum
No	1093.68	376.00	560	2000
Yes	2007.78	563.72	800	3500

Source: Own elaboration

It is observed that the average income of people who have preferences for the consumption of organic quinoa is 2007.78 soles, varying between 800 and 3500 soles. The heterogeneity of income is low at a proportion of 563.72, being the majority group; these conditions show that the people who have the higher income, have higher preferences than those with lower incomes.

Table 4. Consumption preferences of organic quinoa according to knowledge

Consumption of organic quinoa			Knowledge of organic quinoa consumption		Total
			No known benefit of organic quinoa	If you know the benefits of organic quinoa	
PSI	No	Count	19	25	44
		% within PSI	43.18%	56.82%	100,0%
	Yes	Count	9	74	83
		% within PSI	10,84%	89.16%	100,0%
Total		Count	28	84	127
		% within PSI	22,05%	66,1%	100,0%

Source: Own elaboration

It is observed that 89.16% of the households that consume organic quinoa are aware of its benefits and only 10.84% do not know the benefits of organic quinoa, being the majority group; these conditions determine that there are greater probabilities of preferences for the consumption of organic quinoa in people who are aware of the benefits of this product.

Table 5. Preferences for organic quinoa consumption by household size

	Mean	Standard deviation	Minimum	Maximum
No	4	1.26	2	7
Yes	6	1.72	2	9

Source: Own elaboration

The average household size of households that consume organic quinoa is 6 members, varying between 2 and 9 members. The heterogeneity of household size is low, with a proportion of 1.72 being the majority group; these conditions determine that there are greater preferences for consuming organic quinoa in households with larger household size.

Table 6. . Preferences for organic quinoa consumption according to health perception

Consumption of organic quinoa			Health perception		Total
			No	Yes	
PSI	No	Count	29	15	44
		% within PSI	65.91%	34,09%	100,0%
	Yes	Count	6	77	83
		% within PSI	7,23%	92,77%	100,0%
Total		Count	35	92	127
		% within PSI	27,56%	72,44%	100,0%

Source: Own elaboration

It is observed that 92.77% of the households that consume organic quinoa perceive that the consumption of organic quinoa helps to have a better state of health, being the majority group of consumers; these conditions determine that there are greater preferences in the consumption of organic quinoa, since the majority of households consume organic quinoa for their health status.

Table 7. Preferences for the consumption of organic quinoa according the environmental perception

Consumption of organic quinoa			Environmental perception		Total
			No	Yes	
PSI	No	Count	23	21	44
		% within PSI	52,27%	47,73%	100,0%
	Yes	Count	21	62	83
		% within PSI	25,30%	74,10%	100,0%
Total		Count	44	83	127
		% within PSI	34,65%	65,35%	100,0%

Source: Own elaboration

It is also observed that 74.10% of the households that consume organic quinoa perceive that the consumption of organic quinoa helps to take care of the environment., being the majority group of consumers; these conditions determine that there are greater preferences in the consumption of organic quinoa, since the vast majority of households consume organic quinoa to take care of the environment.

Table 8. consumption preferences of organic quinoa according to price perception

Consumption of organic quinoa			Price Perception		Total
			No	Yes	
PSI	No	Count	35	9	44
		% within PSI	79.55%	20,45%	100,0%
	Yes	Count	21	71	83
		% within PSI	14.46%	85.54%	100,0%
Total		Count	47	80	127
		% within PSI	37,01%	62,99%	100,0%

Source: Own elaboration

Since the price of organic food is considerably higher than traditional foods, it is to be expected that the consumer's economic situation will have an influence on the demand for organics. However, Table 8 shows that 85.54% of the households that prefer to consume organic quinoa perceive that the price of organic quinoa is fair and only 14.46% of those who prefer to consume organic quinoa perceive

that the price of organic quinoa is not fair.

OBJECTIVE 1

Of the three specifications of logit models, model 3 was selected, where it is observed that the variables of age of the head of household, family income, knowledge of benefits of organic quinoa, household size, health perception of the head of household and price perception are statistically significant or different from zero, it means that, the null hypothesis that is the coefficients of the variables are equal to zero with a significance level of 5% and 10% respectively, is rejected. In other words, the variables of age of the head of the household, family income, knowledge of the benefits of organic quinoa, household size, perception of health of the head of household and price perception have a positive influence on the preferences for organic quinoa consumption. While the other variables do not influence.

The calculated value of the LR chi2 ratio test is 141.77 indicating that the coefficients jointly are significant in explaining the probability of quinoa consumption preferences, so the null hypothesis that the coefficients associated with each variable are equal to zero is rejected; therefore, the coefficients of the logit model overall are significant in the validity of the estimated model. This implies that the explanatory variables are completely exogenous and that these variables are correctly specified (included) in the estimation of the model (there is no omitted variable problem). The Mc Fadden's Pseudo R2 statistic obtained is 86%, we have a good fit and it can be affirmed that the variables used in the model explain the probability of the preferences for organic quinoa consumption in the city of Puno. According to the prediction percentage, the model predicts 95% correctly, that is, there is a very high level of joint significance in terms of the likelihood ratio statistic.

Table 9. Logit type estimation of the probability of consumption of organic quinoa

Variable	Model 1	Model 2	Model 3
Age	0.2089**	0.2109**	0.1789**
Income	0.0046**	0.0050**	0.0039**
knowledge	2.6510	2.9417*	3.2052*
Marital status	1.0256		
Household size	0.8111*	0.9167**	0.8314**
Health perception	5.9463**	5.7197**	4.7337**
Environmental perception	-3.0341	-3.0914	
Price perception	6.0554**	6.6362**	4.3678**
_cons	-28.0249***	-28.8295***	-25.5473***
N	127	127	127
LR chi2	145.6675	145.2545	141.7786
Akaike	36.2198	34.6328	36.1087
Bic	61.8175	57.3863	56.0179
R2	0.8888	0.8863	0.8651
Likelihood	-9.1099	-9.3164	-11.0543
Prediction	94.87	95.01	95.28

legend: * p<.1; ** p<.05; *** p<.01
Source: Prepared by the authors based on STATA results.

Regarding the age variable, the research determined that it has a positive influence on the probability of preference for organic quinoa consumption that is , as the age of the head of household increases, the probability of preferences for the consumption of organic quinoa increase by 0.76%.,which is in agreement with López (2014) who concluded in his study that age is a determining factor for the consumption of organic quinoa products; this is related to the fact that health is the main reason why organic food is consumed. Likewise, Bermejo(2018) in his study concluded that if the age of the

consumer increases by one year, on average, the probability of consuming organic food increases by 0.7%.

With respect to the variable family income of the head of household, the research determined that it has a positive influence on the probability of preferences for organic quinoa consumption that is , as the household income increases, the probability of consuming organic quinoa increases by 0.01%, which is in agreement with Chata (2017) & Garcia (2016) who in their study conclude that quinoa consumption depends on the income variable, as income increases, quinoa consumption increases by 6.7% over consumption, in the face of a 1% increase in household income. Likewise, Bermejo(2018) in his study concluded that if the family income of the consumer increases by S/. 1,000 per month, on average, the probability of intention to purchase organic food increases by 12.7%.

Regarding the variable knowledge of the benefits of organic quinoa, in the model it was determined that it positively influences the probability of preferences of organic quinoa, that is., as the level of education increases, the probability of preferences of organic quinoa consumption increases by 34%, which is consistent with Philips & Gary (2010), consumer behavior depends on the level of knowledge of the benefits of organic quinoa. However, Huillca (2017), in his work concluded that there is no relationship between consumption and knowledge of organic quinoa attributes.

With respect to the household size variable, the research established that it has a positive influence on the probability of preferences of organic quinoa consumption, that is, as household size increases, the probability of consuming organic quinoa increases by 3.5%, which is in agreement with Garcia (2016), who in his research found that the factors that condition the consumption of quinoa by a family in the city of Puno are associated with the number of members of the household. However, Huillca (2017), in his work concluded that there is no relationship between consumption of organic quinoa in the city of Puno with household size and sex of students.

Regarding the health perception variable of consumers, the research determined that it positively influences the probability of preference for the consumption of organic quinoa, that is, if the head of household perceives that organic quinoa improves the state of health, the probability of preference for organic quinoa consumption increases by 57%, which is in agreement with García (2016) who in his research concludes that the factors that condition the consumption of quinoa by a family in the city of Puno, is for health and nutrition. In turn, Rojas (2014) concluded in his study that the main motivations for the consumption of organic foods were the contribution to health improvement that they represent (35%), the fact that they are healthier foods (34%), being free of any industrial agrochemicals (23%) and that they are very good quality foods (12%). Likewise, López (2014) in his study regarding the factors that influence the purchase of organic food in Mexico. He concluded that the determinant of the consumption of organic food is the health problems faced at an older age, which is related to the fact that health is the main reason why people buy organic food.

The main barriers to organic quinoa consumption preferences are overpricing. The study has determined that consumers' perception of the price of organic quinoa is positive, it means that the head of household perceives that the price of organic quinoa is fair, the probability of preference for the consumption of organic quinoa increases by 41%.

OBJECTIVE2

The description of the variables that have the greatest impact on the preference for the consumption of organic quinoa in the households of the city of Puno, is carried out according to the order of Table 10, classifying the variables as previously seen as variables.

Table 10. Marginal effects of variables influencing the probability of organic quinoa consumption

Variable	Marginal effects	Std. Err.	z	P>z	[95%	C.I.]	X
Age	0.0077	0.0055	1.4	0.162	-0.0031	0.0184	47.9134
Income	0.0002	0.0001	1.35	0.176	-0.0001	0.0004	1690.79
Knowledge of organic quinoa	0.3410	0.3056	1.12	0.264	-0.2580	0.9399	0.7795
Household size	0.0356	0.0353	1.01	0.313	-0.0336	0.1049	5.5433
Health perception	0.5791	0.3639	1.59	0.111	-0.1340	1.2923	0.7244
Price perception	0.4147	0.2497	1.66	0.097	-0.0747	0.9041	0.6299

Source: Prepared by the authors based on STATA results..

- The variable age of the head of household is positive with a value of 0.0076 and is statistically significant at 95% confidence, which indicates that if the age of the older adult increases, their probability of preference for organic quinoa consumption increases by 0.76%, which shows that people who are older have more latent health problems than younger people, which is central to their preference for organic quinoa consumption.
- The household income variable has a positive marginal effect with a value of 0.0001 and is statistically significant at 95% confidence, indicating whether the head of household has a higher income, the probability of consuming organic quinoa increases by 0.01%,
- The marginal effect of the variable knowledge of the benefits of organic quinoa is positive, with a value of 0.3410 and is statistically significant at a 95% confidence level, which means that the more knowledge about the benefits of organic quinoa increases the probability of preference of organic quinoa consumption by 0.34%.
- The marginal effect of the household size variable is positive with a value of 0.03562 and is statistically significant at 95% confidence, which means that the larger the household size, the higher the probability of preference for organic quinoa consumption by 3.5%.
- The marginal effect of the health perception variable is positive with a value of 0.579 and is statistically significant at 95% confidence, which means that if the heads of household perceive that organic quinoa improves their health, the probability of preference for organic quinoa consumption increases by 57%
- The marginal effect of the variable perception of the price of organic quinoa by the head of household is positive with a value of 0.41 and is statistically significant at 95% confidence, which means that if the heads of household perceive that the price of organic quinoa is fair, the probability of preferences for organic quinoa consumption increases by 41%.

The results of the second objective show that the health perception variable and the perception of the price of organic quinoa by consumers, have a greater impact on the probability of preference for the consumption of organic quinoa in households in the city of Puno, with a value of 57.91% and 41.46%, respectively. This is in agreement with García (2016) who in his research finds that the factors that condition the consumption of quinoa by a family in the city of Puno, are the perception of health and nutrition. Likewise, Abad (2017), found that in the city of Chiclayo a large number of people consume quinoa because of its perceived main benefit of nutritional properties and health benefits, besides it can be prepared many varieties of savory and sweet diches.

4. Conclusions

With respect to the first objective, it was determined that the variables of age, family income, knowledge of the benefits of organic quinoa, household size, health perception, and price perception influence have a positive influence on the probability of preference for the consumption of organic quinoa in households in the city of Puno. That is, if the age of the head of household , the family income, knowledge about the benefits of organic quinoa, household size, perception of health, and price

perception increase, the probability of preferences for organic quinoa consumption in households in the city of Puno increases.

The probability of preferences for organic quinoa consumption in households in the city of Puno increases by 0.76%, 0.01%, 34%, 3.5%, 57% and 41%, respectively, while the other variables do not influence the probability of organic quinoa consumption in households in the city of Puno.

In the second objective, the variable of perception of health and perception of the price of organic quinoa by consumers have a greater impact on the probability of preference for the consumption of organic quinoa in households in the city of Puno, with a value of 0.5791 and 0.4146, respectively, and are statistically significant.at a 95% confidence, indicating that if the number of household heads who perceive that organic quinoa improves their health status and perceive that the price of organic quinoa is fair, the probability of preference of organic quinoa consumption in the households of the organic quinoa in households in the city of Puno increases by 57% and 41% respectively.

References

Abad, L. (2017). *Determinación del perfil del consumidor de quinua convencional en la ciudad de Chiclayo*. Universidad Católica Santo Toribio de Mogrovejo.

Bermejo, G. F. (2018). *Factores que influyen en la intención de compra de alimentos orgánios, en los consumidores del distrito Coronel GAL, 2018*. [Universidad Privada de Tacna]. http://www.upt.edu.pe/upt/web/home/contenido/100000000/65519409

Chata, L. (2017). *Consumo de quinua en el Perú en los periodos 2004–2014*. [Universidad Nacional del Altiplano]. http://tesis.unap.edu.pe/bitstream/handle/UNAP/5430/Chata_Maquera_Lorena.pdf?sequence=1&isAllowed=y

FAO Y ALADI. (2014). Tendencias y perspectivas del comercio internacional de quinua (pp. 1990–2013).

García, E. (2016). Comportamiento de las familias de la ciudad de Puno en el consumo de la quinua. Revista Cuestiones de Sociología: Investigación En Ciencia y Desarrollo, 38–51.

Hinostroza, S. (2013). Factores determinates del consumo de quinua en el Valle del Mantaro y su aporte a la seguridad alimentaria. Universidad Nacional Agraria la Molina.

Huillca, H. (2017). Factores asociados con el consumo de Quinua en estudiantes de 4to y 5to de las I.E. secundarias del Distrito de Puno – 2016. [Universidad Nacional del Altiplano]. In Universidad Nacional Del Altiplanoacional del altiplano. http://repositorio.unap.edu.pe/bitstream/handle/UNAP/6238/EPG900-00900-01.pdf?sequence=3&isAllowed=y

Lopez, G. (2019). Factores que influyen en la compra de alimentos orgánicos en México. Un análisis mixto. Small Business International Review, 3(2), 69–85. https://doi.org/10.26784/sbir.v3i2.210

López, O. (2018). Analisis de los factores determinantes en la Produccion orgánica de Quinua en el Distrito de Cabana. In Universidad Nacional Del Altiplano. Universidad Nacional del Altiplano.

Mankiw, G. (2007). Principios de Ecocomía. In Traducción de Esther Rabasco y Luis Toharía (Primera).

Meyhuay, M. (2000). Quinua: Operaciones de Poscosecha. Organización de Naciones Unidas Para La Agricultura y La Alimentación (FAO), 35. http://www.fao.org/3/a-ar364s.pdf

Muñoz, L. C. (2014). Plan de negocios para la exportación de quinua hacia Estados Unidos durante el periodo 2013-2023 [Universidad Tecnológica Equinoccial]. http://repositorio.ute.edu.ec/bitstream/123456789/8366/1/56650_1.pdf

Neira, C., & Londoño, Á. (2018). Factores relacionados con la intención de compra de alimentos orgánicos en consumidores de la Ciudad de Bogotá. XII Congreso Virtual Turismo y Desarrollo, 6(1), 59–71. http://www.eumed.net/rev/turydes/13/volcan_chiriqui.pdf

Oficina de Gestión de la Información y Estadística. (2019). Carpeta Georeferencial Region Puno Perú. Congreso de La República Del Perú, 4, 20.

Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO). (2013). Quinua. FAO. https://www.fao.org/quinoa/es/

Pindyck, R. (2009). Microeconomía. In Microeconomía (Séptima). https://doi.org/10.2307/j.ctt2111g56

Rojas, N. (2014). Análisis de los factores que inciden en la decisión de compra de productos orgánicos en Santiago de Cali [Universidad Autónoma de Occidente]. http://dx.doi.org/10.1016/j.biochi.2015.03.025%0Ahttp://dx.doi.org/10.1038/nature10402%0Ahttp://dx.doi.org/10.1038/nature21059%0Ahttp://journal.stainkudus.ac.id/index.php/equilibrium/article/view/1268/1127%0Ahttp://dx.doi.org/10.1038/nrmicro2577%0Ahttp://