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Conference Paper

Knowledge About Healthy Nutrition Among Students of the Amazon State University and its Campuses

Conocimientos sobre la alimentación saludable en estudiantes de la Universidad Estatal Amazónica y sus sedes

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Abstract

Nutrition constitutes the physiological process by which the body receives, converts, and utilizes the chemical compounds present in food. These nutritive substances are essential for the proper functioning of organs, growth, and performance of all daily physical activities by humans. This research aims to assess the level of knowledge among students at the main campus and its branches regarding nutrition. An explanatory non-experimental study was conducted, determining a sample of 400 students from the schools of agroindustry, biology, environmental sciences, tourism, forestry, agriculture, and social communication. A structured questionnaire based on literature review and the nutritional pyramid was used to collect information and divided into two parts: general and specific. The results revealed the following parameters: 62% of the participants consume food three times a day, while 62.8% ingest 8 glasses of water daily. The perception of a healthy plate is based on a balanced consumption of proteins, carbohydrates, and vegetables. Basic knowledge about the functions of nutritional components in human metabolism was evident. In conclusion, the results reflect varied patterns in the dietary habits and knowledge of university students, emphasizing the importance of nutritional education and the need to promote balanced choices for a healthy diet.

Keywords: *nutrition, physiological, functional, students, university, perception.*

Resumen

La alimentación constituye el proceso fisiológico mediante el cual el organismo recepta, convierte y utiliza los compuestos químicos presentes en los alimentos. Dichas sustancias nutritivas son fundamentales para el adecuado funcionamiento de los órganos, el crecimiento y la ejecución de todas las actividades físicas diarias por parte del ser humano. El propósito de la investigación fue evaluar el nivel de conocimientos de los estudiantes de la matriz y sus sedes en relación con la alimentación. Se llevó a cabo un estudio explicativo no experimental, determinando una muestra de 400 estudiantes de las escuelas Agroindustria, Biología, Ambiental, Turismo, Forestal, Agropecuaria y Comunicación Social. Para recopilar información, se utilizó un cuestionario estructurado basado en la revisión bibliográfica y la pirámide nutricional, dividido en dos partes: general y específica. Los resultados revelaron los siguientes parámetros: el 62 % de los participantes consume alimentos tres veces al día, mientras que el 62.8 % ingiere 8 vasos de agua diariamente. La percepción de un plato saludable se fundamenta en el consumo equilibrado de proteínas, carbohidratos y verduras.

Se evidenció un conocimiento básico sobre las funciones de los componentes alimenticios en el metabolismo humano. En conclusión, los resultados reflejan patrones variados en los hábitos alimentarios y conocimientos de los estudiantes universitarios, destacando la importancia de la educación nutricional y la necesidad de promover elecciones equilibradas para una dieta saludable.

Palabras Clave: *Alimentación, fisiológico, funcional, estudiantes, Universitarios, percepción.*

1. INTRODUCTION

Feeding, a crucial physiological process, involves the reception, transformation, and utilization of food chemical substances. These components have a social character that is integrated into culture and food history. Rooted since the dawn of humanity, it took on a more rigorous and demanding dimension in the 20th century, especially during the interwars [1]. For a deep understanding of this history, it is essential to go back in time, exploring cultural exchanges that have influenced territories, preferences, and food consumption patterns. All this in the context of various economic, technical, and cultural circumstances [2].

Historically, the field and the first systematic studies on food emerged in the Annales, under the direction of F. Braudel. Historical approaches to food are varied, ranging from quantitative perspectives that evaluate food production, diets, calories, and consumption over time to approaches that highlight the social role of food. Analyzing how societies mobilize to guarantee food supply and distribution mechanisms in human groups [3].

According to the World Health Organization (WHO), inadequate nutrition worldwide is the main problem that affects the body. It is recognized that the causes of non-communicable diseases (NCDs) are linked to an unhealthy diet and a sedentary lifestyle. A healthy diet protects against diseases such as diabetes, hypertension, and overweight. Therefore, the importance of cultivating good eating habits from an early age to adulthood is highlighted according to the food pyramid, which includes nutritional links such as fruits, vegetables, meats, dairy products, and cereals [4]. The relationship between healthy nutrition and diseases in the 21st century, cultural changes, and consumption habits of foods prepared outside the home constitute crucial elements for policy formulation and the food industry [5].

The reduction in the incidence of overweight and obesity in university students is presented as a relevant aspect, considering the tendency to consume prepared and semi-processed foods available in the markets [6]. The evolution of the food industry has allowed the use of bioactive elements, mostly from plant species, which become

healthy sources of nutrition, contributing to the metabolic development of the organism [7].

The current diet of young people is characterized by the consumption of pre-prepared, pre-cooked, or instant products with low nutritional content. The provision of adequate nutrition can ensure good health in students, which highlights the importance of considering the type, quantity, and quality of food products [8]. University life, which is marked by significant changes in various aspects, directly impacts academic development. The WHO points out that lifestyle is based on the behavior of people, and young people are a risk group since they tend towards an unhealthy lifestyle. Aggravated by stress and lack of time, which leads to the consumption of a fast and poorly nutritious diet. [9] The consumption of a healthy diet by students depends not only on their preferences but also on the time available to acquire food, generating nutritional imbalances [10]. Given this reality, the research is proposed with the objective of analyzing the level of knowledge and perception of food consumption among university students at Amazon State University and its campuses, focusing on healthy nutrition.

2. METHODOLOGY

2.1. Location

The information gathering was carried out at the Amazon State University and its headquarters (Lago Agrio, province of Sucumbíos, and El Pangui, province of Zamora Chinchipe).

2.2. Method

The present study adopts a non-experimental explanatory approach, considering the 4,999 students who regularly attend both virtually and in person at the Amazonian State University of Puyo and its campuses during the period 2022–2023. The selected sample includes students from various fields, including Agribusiness, Biology, Environmental, Tourism, Forestry, Agriculture and Social Communication.

For the purpose of evaluating the knowledge level, a structured questionnaire was designed that is based on an exhaustive bibliographic review and the principles of the nutritional pyramid. This evaluation instrument consists of two sections: a general part and a specific part. The first seeks to address broad concepts related to the topic, while the second focuses on more detailed and specific aspects.

The choice of this methodological approach allows for a detailed analysis of students' knowledge about food, providing valuable information to understand the participants' perception and understanding of this crucial aspect of health.Principio del formulario

2.3. Sample

The sample size was determined with the purpose of obtaining a perspective on students' knowledge about healthy nutrition at the institution and its campuses. Equation (1) was applied to determine the sample.

$$N = \frac{m}{(e)^2(m-1)+1}$$

$$N = \frac{4999}{(0{,}05)^2(4999-1)+1}$$

$$N = 400$$

Where:

N= sample

e = error

m= population

3. RESULTS

400 surveys were carried out, in which 70% of the respondents were from the Puyo headquarters, 15.3% from the Pangui campus, and 14.4% from Lago Agrio, as detailed in Table 2.

Tabla 1

Distribution of respondents in the headquarters and its campuses.

	Frequency	Percentage
Lago Agrio	58	14,4
Pangui	61	15,3
Puyo	281	70,3
Total	400	100

Table 3 shows that 62% of the institution's students ate three times a day, in contrast to 25% who opted for five meals a day. This variability could be attributed to various contextual factors, such as time constraints, financial constraints, and academic, social, and health matters.

Tabla 2

Number of meals per day.

	Frequency	Percentage
1	2	0.5
2	16	4.0
3	248	62.0
5	102	25.5
When hungry	32	8.0
total	400	100.0

In Table 4, the daily water consumption of the students was detailed, showing that 62.8% drink 8 glasses of water. By considering an estimated volume of 200 ml per glass, a per capita consumption of 1600 mL of water per student was determined. This consumption pattern, which is significant, was identified as crucial to maintaining the balance of bodily functions, ensuring hydration, and providing essential minerals such as calcium, magnesium, and fluoride, thus contributing to the strengthening of bones and teeth.

Tabla 3

Glasses of water consumed per day.

Valid	Frequency	Percentage
3	40	10.0
6	82	20.5
8	251	62.8
Unknown	27	6.8
Total	400	100

According to Table 5, the absence of variation in the criteria is confirmed. Given that 27.8% of students noted that breakfast is the most important meal, compared to 30% who consider both breakfast and lunch, and 29.3% consider all meals to be important. This pattern suggests an alteration in diets and eating habits, factors that may be related to the development of cardiovascular diseases, digestive system disorders, anemia, dyslipidemia, and some types of cancer.

Eating that promotes a healthy diet requires a proper balance between nutrition and physical activity. According to Table 6, 83.5% of students indicated that consuming more than 50% of protein, carbohydrates, and vegetables on the plate constitutes a healthy balance. This criterion aligns with the concept of a healthy plate proposed by experts at the Harvard School of Health, which refers to the balance of nutrients in the body

Tabla 4

Timing of Food Intake.

Valid	Frequency	Percentage
Lunch	44	11.0
Lunch + Dinner	5	1.3
Breakfast	111	27.8
Breakfast + Lunch	120	30.0
Dinner	3	.8
All	117	29.3
Total	400	100.0

through food consumption. This finding suggests that most students manage to balance and maintain an adequate proportion of nutrients in their daily meals.

Tabla 5

Healthy Dish.

Valid	Frequency	Percentage
Water, vegetables and fruits	33	8.3
Unknown	14	3.5
Fruits and vegetables	19	4.8
Proteins, carbohydrates, and vegetables	334	83.5
Total	400	100.0

Milk, a secretion from the mammary glands of mammals, is the most consumed beverage from cattle by the population since it provides a large amount of nutrients, such as proteins and sugars. In Table 7, it is evident that 42.8% of the students indicated that the nutritional contribution of this product is based on vitamins, amino acids, and minerals. On the other hand, 31.8% indicated that milk contributes to body functions related to bone structure, nerve impulse transmission, and muscle construction. Finally, 14.2% of young university students did not know the function of milk.

In Table 8, the students' perceptions regarding the function played by vegetables were recorded. It is notable that 61.3% of the participants indicated that vegetables contribute to the supply of vitamins, compared to 21.5% who consider that they promote growth.

The relevance of the nutritional pyramid in food lies in its guiding function towards a healthy and balanced diet. Under this concept, as shown in Table 9, 64.5% of the students agree that this element incorporates essential components such as proteins, fats, fruits, vegetables, and carbohydrates.

Tabla 6

Milk function.

Valid	Frequency	Percentage
Provides vitamins, amino acids, and minerals	171	42.8
Unknown	57	14.2
Bone structure, nerve impulse transmission and muscle construction	127	31.8
Promotes intestinal function	40	10.0
Build muscles	5	1.3
Total	400	100.0

Tabla 7

Vegetable function.

	Frequency	Data
Valid	2	5.
Act as a coenzyme	39	9.8
Provide vitamins, amino acids, and minerals	245	61.3
Unknown	28	7.0
Favors growth	86	21.5
Total	400	100.0

Tabla 8

Nutritional pyramid.

	Frequency	Percentage
Unknown	9	2.2
Minerals, fruits, and vegetables	16	4.0
Proteins, amino acids, and fruits	9	2.3
Proteins, fats, fruits, vegetables, and carbohydrates	258	64.5
All of the above	108	27.0
Total	400	100.0

In Table 10, it was observed that 66% of the students had knowledge about the function of vitamin C and how it facilitates the absorption of iron in the body. In contrast, 9.8% of students were unaware of this benefit.

In table 11, 40% of the students report that this element facilitates intestinal transit, while 23.5% say that they think it prevents diseases. Ignorance of the importance of fiber consumption allows the presence of conditions in the digestive system.

Tabla 9

Role of Vitamin C in Iron absorption.

Valid	frequency	Percentage
Uknown	97	24.3
No	39	9.8
Yes	264	66.0
total	400	100.0

Tabla 10

Importance of fiber consumption.

	Frequency	Percentage
Valid	5	1.3
Unknown	90	22.5
It is low cost	6	1.5
Avoid gaining weight	45	11.3
Facilitates intestinal transit	160	40.0
It prevents illnesses	94	23.5
Total	400	100.0

Saturated and trans fats negatively impact the human body, being commonly solid at room temperature. The permitted consumption of these fats varies between 25% and 30% in relation to body weight. Table 12 shows that 59% of students consumed these saturated fats, possibly due to their ease of preparation or acquisition, in contrast to 19.8% of young people who opted for unsaturated fats.

Tabla 11

Allowable fat consumption.

	Frequency	Percentage
Valid	2	.5
Unknown	60	15.0
Unsaturated	79	19.8
Saturated	236	59.0
Total	23	5.8
total	400	100.0

Las frutas han sido reconocidas como una fuente primordial en una dieta saludable, y su consumo se ha asociado con la prevención de algunas enfermedades. Al examinar la Tabla 13, se constató que el 59 % de los estudiantes solían consumir frutas hasta en 5 ocasiones diarias, en contraste con el 23 % que lo hacía únicamente una vez al día.

Estos hallazgos reflejan un equilibrio en el patrón de consumo de este producto dentro de la población universitaria.

Tabla 12

Daily consumption of fruits and vegetables.

	Frequency	Percentage
A	5	1.3
Five	43	10.8
Unknown	24	6.0
More than one	236	59.0
One a day	92	23.0
Total	400	100.0

Food selection must be adjusted to the physiological conditions of each individual and consumed in optimal environments, considering variables such as time and age. In Table 14, it was evident that 94.3% of the students used to prepare their food at home. This approach gave them significant control over the volumes and portions they ate.

Tabla 13

Place of consumption of food.

	Frequency	Percentage
Valid	2	.5
Home	377	94.3
Street food	1	.3
Unknown	3	.8
Other	7	1.8
Restaurant	8	2.0
soda bar	2	.5
Total	400	100.0

Eating habits, crucial for the student's well-being, are based on the adoption of balanced nutrition and basic knowledge about how to maintain an adequate diet. Table 15 shows that 81% of the students shared the perception that the professionals in the area, responsible for managing truthful sources about these food processes, were the ones who should transmit the information and provide their suggestions.

Human food sources mostly come from animal and plant species. Table 16 shows that 40.3% of the students showed a preference for consuming vegetables and salads, compared to 26% who preferred nuts and 18% who opted for dairy products or their derivatives. These results indicate a varied choice between food groups, which allowed them to maintain a balance in their diet and achieve nutritional balance.

Tabla 14

Sources of information regarding food.

	Frequency	Percentage
Valid	4	1.0
Friends	9	2.3
Unknown	8	2.0
Nurses	7	1.8
Nutritionists	324	81.0
Others	15	3.8
Social networks	16	4.0
Universities	17	4.3
Total	400	100.0

Tabla 15

The most frequently consumed foods.

	Frequency	Percentage
Valid	3	.8
Unknown	13	3.3
Vegetable salads	161	40.3
Fresh fruits	104	26.0
Soft drinks/nectars	1	.3
Burgers/sandwich	1	.3
Milk, yogurt, or cheese	72	18.0
Others	18	4.5
Fish	27	6.8
Total	400	100.0

4. DISCUSSION

Based on Table 3 [11], the optimal daily meal frequency may vary depending on the individual needs and circumstances of each person. However, in general terms, the consumption of food in multiple portions throughout the day is recommended to maintain nutritional and energy balance. Most people followed a pattern of eating three main meals a day (breakfast, lunch, and dinner), with the addition of two or three healthy snacks in between. In relation to table 4 [12], it was highlighted that the human body does not store water, which underlines the importance of replacing the lost amount daily to guarantee the proper functioning of the body. Furthermore, [13] indicated that for healthy people, thirst was an adequate guide to water intake, except for infants, athletes, and most elderly and sick people. Table 5 [14], established that lifestyles are related to the main risk factors for public health problems, especially in Western countries. [15] pointed

out that the technological revolution, although it contributed to human development, also generated consequences such as sedentary lifestyles and unhealthy eating habits, contributing to environmental deterioration. Table 6 [16] emphasized that an adequate diet could be achieved through the varied consumption of foods that provide various essential nutrients such as proteins, carbohydrates, fats, vitamins, minerals, and water. Table 7 [17] highlighted that milk was a valuable source of proteins, healthy fats, vitamins, and minerals, whose nutritional value depended not only on the nutrients present but also on their daily bioavailability. Table 8, according to the World Health Organization (WHO) [18], highlighted that low consumption of fruits and vegetables contributed to 31% of heart diseases and 11% of strokes worldwide. It promoted an increase in the production and consumption of these foods. Table 9 [16] addresses the fact that university students, subjected to emotional and physiological changes, could face health conditions if they did not comply with nutritional recommendations. Lifestyle during college influenced academic performance. Table 10 highlights the importance of iron absorption, depending on the type of food and the interaction with vitamins such as A and C, which are essential for its homeostasis [19]. Table 11 [17] mentions that dietary fiber plays a crucial role in the prevention and treatment of chronic diseases, and its presence in fruits, vegetables, and whole grains protects against cardiovascular diseases. Table 11 [20] addressed the importance of fats in the diet, pointing out their role in cardiovascular prevention as one of the best-studied nutritional topics. Table 12 [21] discussed the challenge of meeting the WHO recommendation of consuming at least 5 servings, or 400 g, of fruits and vegetables daily. Healthy eating was highlighted as crucial for growth, development, and well-being. Table 13 [22] highlighted that the consumption of fruits and vegetables was essential to maintaining a balanced diet and promoting health due to their richness in vitamins, minerals, fiber, and antioxidants. Table 14 shows changes in food consumption patterns in recent years, with an increase in the acquisition of semi-finished products linked to economic factors and the supply of traditional street products [23].

Table 15 [24] explored the influence of contemporary society on young people, who showed excessive concern about their bodies, putting them at risk for the development of eating disorders. Table 16 [25] discussed the complexity of factors that determine food selection in the diet, including availability and sociocultural factors.

5. CONCLUSIONS

In conclusion, the results reflect varied patterns in the eating habits and knowledge of university students, highlighting the importance of nutritional education and the need to promote balanced choices for a healthy diet.

These results will allow us to generate a healthy nutrition plan at our educational institution.

References

[1] Pérez Samper MA. La historia de la historia de la alimentación. Chronica Nova. Revista de Historia Moderna de la Universidad de Granada. 2009;35:105–162.

[2] Daza BY. Historia del proceso de mestizaje alimentario entre Espa na y Colombia. Pedralbes: Revista d'història Moderna. 2013;34(0):323–346.

[3] Braudel F. Vie materiélle et comportaments biologiques. Annales. E.S.C. 1961. XVI, 3, 545-549. Alimentation et catégories de l'histoire. Annales. E.S.C., XVI, 4, 723-728.

[4] Reyes Narvaez S, Canto MO. Conocimientos sobre alimentación saludable en estudiantes de una universidad pública. Rev Chil Nutr. 2020;47(1):67–72.

[5] Jimenez de la Jara J. Alimentos Sanos y Seguros: Un desafío permanente. Revista Nutrición, Salud y Bienestar. Nº3 / 2005. Chile: Nestlé Chile S.A.; 2005.

[6] Dabelea D, Mayer-Davis EJ, Imperatore G. The value of national diabetes registries: SEARCH for diabetes in youth study. Curr Diab Rep. 2010 Oct;10(5):362–369.

[7] Enríquez-Estrella MÁ, Poveda-Díaz SE, Alvarado-Huatatoca GI. Bioactivos De La Hierba Luisa Utilizados En La Industria. Rev Mex Cienc Agric. 2023;14(1):1–11.

[8] Pi R, Vidal P, Brassesco B, Viola L, Aballay L. Nutritional status in university students: Its relationship with the number of daily food intakes and the consumption of macronutrients. Nutr Hosp. 2015;31(4):1748–1756.

[9] Cerón Souza C. Estilos de Vida y Actividad Física. Universidad y Salud. 2012;14(2):115. http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0124-71072012000200001&lng=en&tlng=es

[10] Barquera S, Rivera-Dommarco J, Gasca-García A. Políticas y programas de alimentación y nutrición en México. Salud Publica Mex. 2001;43(5):464–477.

[11] Castro JM. Promoción de la salud en la comunidad. In: González R, Moreno L, Castro JM, editors. La salud pública y el trabajo en la comunidad. México: McGraw-Hill; 2010. pp. 183–191.

[12] Botero J, Fernando Ospina J. Crecimiento y desempe no general de juveniles silvestres de mero guasa Epinephelus itajara (Lichtenstein) mantenidos en jaulas flotantes bajo diferentes condiciones de cultivo. Boletín de Investigaciones Marinas y Costeras-INVEMAR. 2003;32(1):25–36.

[13] Fernández-Martín JL, Benito Cannata-Andía J. Agua de bebida como elemento de la nutrición. Med Clin (Barc). 2008;131(17):656–657.

[14] Jéquier E, Constant F. Water as an essential nutrient: the physiological basis of hydration. Eur J Clin Nutr. 2009. [Online]. Disponible en: http://www.nature.com/ejcn/journal/vaop/ncurrent/pdf/ejcn2009111a.pdf. https://doi.org/10.1038/ejcn.2009.111.

[15] Tuero C, Márquez S. Estilos de Vida y Actividad Física. Espa na: Ediciones Díaz, Santos; 2009.

[16] Feo O. Reflexiones sobre la globalización y su impacto sobre la salud de los trabajadores y el ambiente. Conferencia dictada en la II Conferencia Internacional sobre Salud Ocupacional y Ambiental. Venezuela: Universidad de Carabobo Maracay; 2002.

[17] Becerra F, Pinzón G, Vargas M. Estado nutricional y consumo de alimentos de estudiantes universitarios admitidos a la carrera de medicina. Rev Fac Med (Caracas). 2012;60 Supl:S3–12.

[18] Yip R. Hierro. Conocimientos actuales sobre nutrición. 8th ed. Washington (DC): Organización Panamericana de la Salud; 2003. pp. 340–356.

[19] Liu S, Manson JE, Stampfer MJ, Rexrode KM, Hu FB, Rimm EB, et al. Whole grain consumption and risk of ischemic stroke in women: A prospective study. JAMA. 2000 Sep;284(12):1534–1540.

[20] Enríquez Estrella MÁ. Chocolate coverage based on two Ecuadorian varieties CCN51 and Super Tree in the province of Pastaza, Ecuador. Estudios sociales. Revista de alimentación contemporánea y desarrollo regional. 2022;32(60).

[21] Rimm EB, Ascherio A, Giovannucci E, Spiegelman D, Stampfer MJ, Willett WC. Vegetable, fruit, and cereal fiber intake and risk of coronary heart disease among men. JAMA. 1996 Feb;275(6):447–451.

[22] Carrillo Fernández L, Dalmau Serra J, Martínez Álvarez JR, Solà Alberich R, Pérez Jiménez F. Grasas de la dieta y salud cardiovascular. Clin Investig Arterioscler. 2011;23:1–36.

[23] Organización Mundial de la Salud. Estrategia mundial sobre régimen alimentario, actividad física y salud. [Internet] Ginebra (Suiza): OMS. 2004.

[24] Enríquez EM, Kevin MV, Uvidia CH. Alimentos funcionales la tendencia de consumo del siglo XXI. Reciena. 2022;2(1):10–19.

[25] Attie I, Brooks-Gunn J. Development of eating problems in adolescent girls: A longitudinal study. Dev Psychol. 1989;25(1):70–79.