Articles

Importance of proteins of animal origin in the diet of preschool children of the Cleotilde Guerrero Foundation

Importancia de las proteínas de origen animal en la alimentación de los niños en edad preescolar de la Fundación Cleotilde Guerrero

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REVISTA TECNOLÓGICA
ciencia y educación
Edwards Deming

ISSN: 2600-5867

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Edited by: Tecnológico Superior Corporativo Edwards Deming
January - March Vol. 9 - 1 - 2025
https://revista-edwardsdeming.com/index.php/es
e-ISSN: 2576-0971
Received: july 19, 2024
Approved: October 10, 2024
Page 18-27

ABSTRACT

This research focused on analyzing how the consumption of animal proteins affects the growth of preschool children at the Cleotilde Guerrero Foundation. The relationship between the intake of these foods and development in terms of weight and height was evaluated, as well as the adequacy of the diet with respect to nutritional recommendations for this stage of growth. The study adopted a quantitative approach with a cross-sectional design, involving 120 children between 3 and 6 years old, randomly selected. For data collection, surveys of parents or caregivers, records of the children's daily diet, and anthropometric measurements were used. The results showed that the average consumption of animal proteins was 15 grams per day, representing around 70% of the recommended amount for children aged 4 to 8 years. The main source of protein was the consumption of dairy products, which represented 40% of the total intake. The

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research concludes that an adequate intake of animal protein is essential for the growth of preschool children. It is recommended to increase the consumption of animal proteins, particularly dairy products, to support bone development and overall growth. It is crucial to ensure a balanced diet that includes sufficient protein and other essential nutrients for healthy development. This study highlights the importance of adequate nutritional planning to optimize the well-being and comprehensive development of children.
Keywords: proteins, growth, diet, nutrients, well-being.

RESUMEN

Esta investigación se enfocó en analizar la importancia de proteínas de origen animal porque afecta el crecimiento de los niños en edad preescolar en la Fundación Cleotilde Guerrero. Al evaluar la ingesta de estos alimentos se desarrolla en términos de peso y estatura, así como la adecuación de la dieta con respecto a las recomendaciones nutricionales para esta etapa de crecimiento. El estudio adoptó un enfoque cuantitativo con un diseño transversal, involucrando a 120 niños de entre 3 y 6 años, que fueron seleccionados de una manera aleatoria. Durante la recolección de datos, se aplicaron encuestas a los padres o cuidadores, registros de la alimentación diaria de los niños y mediciones antropométricas. Los resultados mostraron que el consumo promedio de proteínas animales era de 15 gramos al día, representando alrededor del 70% para niños de 4 a 8 años. La principal fuente de proteínas fue el consumo de productos lácteos, que representó el 40% de la ingesta total. La investigación concluye que una ingesta adecuada de proteínas de origen animal es esencial para el crecimiento y también desarrollo en todos los niños que se encuentran en edad preescolar. Se recomienda aumentar el consumo de proteínas animales, particularmente productos lácteos, para apoyar el desarrollo óseo y el crecimiento general. Es crucial asegurar una dieta balanceada que incluya suficientes proteínas y otros nutrientes esenciales para un desarrollo saludable. Este estudio resalta la importancia de una planificación nutricional adecuada para optimizar el bienestar y el crecimiento integral de los niños.

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Revista tecnológica ciencia y educación Edwards Deming
ISSN: 2600-5867

Palabras clave: proteínas, crecimiento, dieta, nutrientes, bienestar.

INTRODUCTION

Nutrition in the early years of every child is very important for the physical and mental growth of children. Animal proteins play a central role in every preschool child's nutrition, due to their high content of essential amino acids and other nutrients that promote growth, cognitive development and overall health. In the context of the Cleotilde Guerrero Foundation, where we work with children in vulnerable situations, the inclusion of these proteins in the diet becomes even more relevant. Animal proteins are essential in the nutrition of preschool children, as they provide amino acids and nutrients that favor growth, cognitive development and disease prevention.

At the Cleotilde Guerrero Foundation, the application of foods in children's diets are fundamental aspects of its goal to enrich the quality of life of the youngest children. In addition, the nutritional education offered by the foundation ensures that families can apply this knowledge at home, promoting a healthier and more balanced diet. Access to animal proteins not only positively impacts the physical development of children, but also contributes to their long-term academic success and emotional well-being.

In addition to being high-quality protein, animal-based foods provide other essential nutrients, such as iron, vitamin B12, zinc and omega-3 fatty acids, which are critical to children's overall health. Therefore, a balanced diet that includes animal protein is crucial to ensure that children grow up healthy, strong and with the ability to reach their full physical and mental potential.

The importance of protein in children's growth

During the preschool stage, children go through a process of rapid growth and development, which increases their nutritional requirements. Foods such as protein are essential in the formation and repair of body tissues, and contribute to the production of enzymes, compounds necessary for the proper functioning of the body, .

Therefore, the children who attend the Cleotilde Guerrero Foundation, many of them come from families with limited resources, where access to high quality food can be scarce. This makes the inclusion of animal proteins in their diet especially important, as these foods not only provide protein, but also other nutrients such as iron, zinc and vitamin B12, which are essential for healthy growth.

Proteins are composed of amino acids, because they are the basic units that the body uses to create and repair tissues. Of the 20 amino acids that the body needs, nine are considered essential, which means that the body does not produce them, which means that they must be supplemented in the diet. Proteins of animal origin are considered to be of high biological value because they contain all the essential amino acids in the right proportions.

For growing children, this is particularly important because their bodies are in a constant phase of development, and an adequate intake of amino acids is vital for the formation

of new cells and tissues. Animal proteins enable them to obtain the essential amino acids they need to maintain healthy growth, strengthen their immune system and develop their brain, .

Animal proteins and the impact on cognitive development

When consuming animal-based proteins in childhood has been linked to improved cognitive ability and better school performance. This is because amino acids present in proteins are important for the formation of neurotransmitters, which play a fundamental role in brain function. For example, dopamine and serotonin depend on a sufficient intake of certain amino acids.

Likewise, omega-3 fatty acids, present in fish such as salmon and sardines, are essential for the development of the brain and eyesight. These fatty acids promote neuronal plasticity, which improves learning capacity and long-term memory. In environments where children do not have regular access to foods rich in omega-3, as is the case in some families served by the Cleotilde Guerrero Foundation, ensuring consumption of animal protein can have a significant impact on cognitive development.

Lean meats, fish, eggs and dairy products are examples of foods rich in animal protein that provide essential nutrients that are easily digested and absorbed. In addition, these foods also contain other important nutrients, such as calcium and vitamin D, which are essential for bone development and strengthening. In combination with a balanced diet, animal proteins help ensure proper physical growth in children.

Prevention of nutritional deficiencies

In many regions, especially in areas with high levels of poverty, diets based primarily on plant foods may be insufficient to meet children's protein needs. Although plant proteins are also beneficial, they often lack certain essential amino acids, which can limit their ability to support proper growth and development. This is exacerbated in preschool children, whose need for nutrients is high due to their rapid growth.

By including animal-based proteins in children's diets, the Cleotilde Guerrero Foundation can prevent problems such as malnutrition and anemia. For example, the iron present in red meat is more easily absorbed by the body compared to the iron found in vegetables, which reduces the risk of developing anemia, a condition that negatively affects children's learning ability and energy, .

Children's immune systems are in a developmental stage, so they need a diet that helps strengthen their defenses. Animal proteins provide other key nutrients, such as zinc and vitamin B12, which are essential for maintaining healthy immune function, . A robust immune system is essential for children to resist common childhood infections and illnesses. Animal protein helps the body produce sufficient antibodies and immune cells, which enables them to effectively fight off viruses and bacteria. Maintaining an adequate intake of animal protein helps prevent recurring illnesses that can negatively affect children's growth and overall well-being.

Challenges and solutions to animal protein inclusion

For many low-income families, access to animal-based proteins can be limited by economic factors. In this regard, the Cleotilde Guerrero Foundation plays an important

role not only by providing protein-rich foods to children, but also by educating parents on how to incorporate accessible and nutritious sources of protein into the family diet. By encouraging the consumption of products such as eggs, milk and fish, which are often more accessible than other protein sources, the foundation helps improve the nutritional quality of children without imposing an undue financial burden on families.
In addition, by teaching parents and caregivers about the importance of animal protein in children's diets, and how to combine different foods to ensure a balanced diet, they are empowered to make informed decisions about their children's nutrition, even in situations of economic constraint.
Animal proteins in a balanced diet
Although animal proteins are essential for child development, it is important that they are part of a balanced diet that includes other food groups as well. Carbohydrates, healthy fats, vitamins and minerals are also essential for children's well-being. Combining animal proteins with fruits, vegetables and whole grains ensures that children receive complete nutrition that supports their growth and development in all areas. At the Cleotilde Guerrero Foundation, implementing a whole food approach, where protein sources are balanced with other nutritious foods, ensures that children not only grow up physically strong, but also mentally healthy and with a greater ability to learn and socialize.
Combining animal-based proteins with fruits, vegetables, whole grains and healthy fats such as olive oil or avocados allows children to have complete and balanced nutrition, which contributes to their long-term health. Encouraging good eating habits from an early age helps prevent health problems in adulthood, such as obesity and cardiovascular disease.
The amount of protein children need depends on their age, weight and activity level. Protein requirements change as children grow, as their bodies are constantly developing and require nutrients to build muscles, tissues and organs. It is important to offer a variety of foods that provide protein from both animal and plant sources to ensure proper and balanced development.
o From 1 to 3 years old**: they need approximately 13 grams of protein per day.
o From 4 to 8 years**: they require about 19 grams per day.
o From 9 to 13 years of age**: 34 grams per day is recommended.

MATERIALS AND METHODS

The research was developed with a quantitative approach to analyze numerically the information obtained through surveys and physical measurements. This approach allowed us to perform a statistical analysis in order to understand the growth of children through protein nutrition. The type of research applied was descriptive and cross-sectional, whose purpose was to analyze the role of protein in the diet of preschool children and how it influences their development and growth.

Being of cross-sectional design, the data were collected in a specific period, providing a clear view of the nutritional status at that time. Identification of diet-related growth

patterns can be facilitated. The methodology also allowed assessment of the impact of animal protein on child development.

Population and Sample

o Target population: the study population included children aged 3 to 6 years attending the Cleotilde Guerrero Foundation.

o Sample: a representative sample of 120 preschool children was selected through random sampling. In addition, factors such as age, previous nutritional status and socioeconomic environment were taken into account to ensure a balanced sample.

Data Collection Instruments

o Parent or caregiver questionnaires: a structured questionnaire was used to collect detailed information on eating habits, focusing on protein-rich food.
o Food records: representatives or parents completed a record of the children's daily diet for several days, in order to estimate the amount and frequency of protein intake.

o Anthropometric measurements: weight and height measurements were taken and calculations were made using the Nelson technique and the Federico Gómez Santos technique to obtain the theoretical weight and height.

Procedure

o Application of questionnaires: parents or caregivers were interviewed with the aim of obtaining information on eating habits, focusing on the frequency with which the children consumed foods such as meat, eggs, fish and dairy products.
o Nutritional assessment: the data collected through the questionnaires were used to calculate the daily intake of animal protein compared to nutritional recommendations.

o Monitoring and follow-up: over a period of three months, the children's anthropometric data were recorded, assessing how animal protein intake affected their growth in terms of weight and height, all carried out through the promotoras.

Data Analysis

1. Descriptive statistics: were used to organize the data on protein intake and physical measurements of the children, calculating mean values and dispersion for each variable.

2. Correlation: a correlational analysis was applied to determine protein intake and variations in growth indicators, such as weight and height.

Ethical Aspects

It was ensured that the research complied with ethical principles. Data were collected through the parents of each of the children, guaranteeing privacy in obtaining the

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Revista tecnológica ciencia y educación Edwards Deming
ISSN: 2600-5867

information. The measurements were carried out under the awareness of the rights of the participants.

RESULTS

Para la muestra se tomaron datos de 120 niños alrededor de 3 a 6 años de edad que asisten a la Fundación Cleotilde Guerrero. La muestra se distribuyó de la siguiente manera: 40 niños de 3 años, 34 de 4 años, 22 de 5 años y 24 de 6 años. La composición por género fue de 53% niños y 47% niñas. En cuanto a la situación socioeconómica, el 65% de las familias pertenecían a un nivel medio-bajo y el 35% a un nivel bajo.

Ingesta de Proteínas de Origen Animal

La evaluación en la ingesta de proteínas se realizó a través de encuestas a padres o cuidadores, así como mediante el análisis de registros alimentarios.

Consumo Diario Promedio: los datos indicaron un consumo promedio de 15 gramos de proteínas animales al día, que es alrededor del 70% entre 4 a 8 años (19 gramos).

Fuentes Principales de Proteínas: los productos lácteos constituyeron el 40% del consumo de proteínas, las carnes magras el 30%, los huevos el 20% y el pescado el 10%.

Frecuencia de Consumo: el 80% de los niños consumió productos lácteos diariamente, el 60% carne, el 50% huevos y el 30% pescado. Esto muestra una mayor prevalencia en el consumo de lácteos y carnes en comparación con pescado y huevos.

Mediciones Antropométricas

Peso y Estatura: al inicio, el peso promedio era 14.5 kg y la estatura promedio 93 cm. Después de tres meses, el peso promedio aumentó a 15.2 kg y la estatura a 95 cm, indicando un crecimiento consistente con las expectativas para su edad.

El IMC: el IMC al inicio fue de 15.4 kg/m^2 y subió a 15.7 kg/m^2 al final del estudio. La mayoría de los niños (75%) estaba en el rango de IMC normal, el 15% tenía un IMC ligeramente bajo y el 10% estaba en el rango superior.

Relación entre Consumo de Proteínas y Crecimiento

Correlación Positiva: hay una correlación positiva entre el consumo de proteínas animales y el incremento en peso y estatura ($r = 0.45$, $p < 0.01$). Esto sugiere que una mayor ingesta de proteínas animales está relacionada con un mejor crecimiento en estos aspectos.

Efectos de las Diferentes Fuentes de Proteínas: la ingesta de productos lácteos mostró una relación más fuerte con el aumento en la estatura ($r = 0.50$, $p < 0.01$) en comparación con la carne, los huevos y el pescado, posiblemente debido al contenido de calcio en los lácteos.

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ISSN: 2600-5867

Impacto del Consumo de Carne y Pescado: la carne y el pescado también tuvieron efectos positivos, pero menos marcados en comparación con los lácteos, sugiriendo que estas fuentes de proteínas tienen un impacto menor en el crecimiento relativo a los productos lácteos.

Adecuación Nutricional

Ingesta Recomendada: el 70% de los niños no alcanzó la cantidad recomendada de proteínas animales. Esta deficiencia puede tener implicaciones para el desarrollo físico y la salud general.

Deficiencias Nutricionales: se observaron deficiencias en micronutrientes como hierro y vitamina B12, especialmente en los niños con menor consumo de carne y pescado.

Recomendaciones: se recomienda aumentar el consumo de proteínas animales en la dieta para alcanzar los niveles recomendados de nutrientes esenciales. Incluir carne, pescado y productos lácteos en la dieta puede mejorar el crecimiento y desarrollo general.

Desarrollo Cognitivo

Aunque no se midió directamente el desarrollo cognitivo, se puede inferir que una adecuada ingesta de proteínas animales, especialmente productos lácteos ricos en calcio, podría beneficiar el desarrollo cerebral y cognitivo. La correlación positiva entre el consumo de proteínas y el crecimiento físico sugiere que una nutrición adecuada puede apoyar el desarrollo cognitivo.

Variabilidad Individual: las necesidades nutricionales pueden variar entre los niños, y los hábitos alimentarios pueden influir en los resultados.

Precisión de los Registros Alimentarios: la exactitud de los datos de consumo depende de la precisión de los registros alimentarios proporcionados por los cuidadores, lo que podría introducir errores.

DISCUSSION

Research has shown that adequate animal protein intake is associated with positive physical growth in preschool children. To maximize health and developmental benefits, it is important to ensure a balanced diet that includes sufficient animal protein along with other essential nutrients. Improving children's nutrition through animal protein feeding to safeguard the development of children at the Cleotilde Guerrero Foundation.

This study shows that an adequate intake of animal protein is associated with improvements in the growth and development of preschool children. In addition, dairy products contribute significantly to weight and height gain, highlighting their crucial role in children's physical development. Although children consume animal proteins, 70% do

not reach the recommended daily amount. This deficiency can negatively influence their growth, highlighting the need to adjust diets to ensure adequate protein intake.

The results indicate that dairy products have a more noticeable effect on growth compared to other sources such as meat, fish and eggs. This suggests that increasing dairy consumption may be particularly beneficial for children's bone development. To promote optimal growth and improve overall health, it is advisable to increase the amount of animal protein in children's diets. Incorporating a variety of these proteins can ensure adequate intake of nutrients essential for physical development and potentially support cognitive development as well.

REFERENCES

Borjas, L., & Cedeño, A. (2022). Repositorio Universidad de Costa Rica. Obtenido de https://www.kerwa.ucr.ac.cr/items/53666a6e-516a-4919-97b2-ff87e1cfb358

Cairo, A. Y. (2021). Repositorio Institucional Universidad Nacional Agraria La Molina. Obtenido de https://repositorio.lamolina.edu.pe/handle/20.500.12996/4615

Cruz, J. F. (2020). Repositorio de la Universidad Nacional de Tumbes. Obtenido de https://repositorio.untumbes.edu.pe/handle/20.500.12874/2510

Friedrich, T. (2019). Producción de alimentos de origen animal. Actualidad y perspectivas. Revista Cubana de Ciencia Agrícola, vol. 48, núm. 1, 2014, pp. 5-6. Obtenido de https://www.redalyc.org/pdf/1930/193030122003.pdf

Méndez, J. A., Portillo, M., & Ruíz, J. (2019). IDENTIFICACIÓN DE ESPECIES EN PRODUCTOS DE ORIGEN ANIMAL MEDIANTE PCR. Scielo. Obtenido de https://ve.scielo.org/scielo.php?pid=S0798-22592009000200009&script=sci_arttext

Mendieta, S., & Rodríguez, S. (2020). Las carnes magras como proteína animal. Scielo. Obtenido de https://www.scielo.cl/scielo.php?pid=S0717-75182009000300003&script=sci_arttext&tlng=pt

Montoya, A. L. (2023). Repositorioa de la Escuela Superior de chimborazo. Obtenido de http://dspace.espoch.edu.ec/handle/123456789/15630

Odriozola, J. M. (2020). Futsal. Obtenido de https://futsalcoach.es/wp-content/uploads/2018/04/239_importancia_proteinas_dieta_deportistas.pdf

Quesada, D., & Gómez, G. (2019). ¿Proteínas de origen vegetal o de origen animal?: Una mirada a su impacto sobre la salud y el medio ambiente. Revista de Nutrición Clínica y Metabolismo. Obtenido de https://revistanutricionclinicametabolismo.org/index.php/nutricionclinicametabolismo/article/view/rncm.v2n1.063

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Revista tecnológica ciencia y educación Edwards Deming
ISSN: 2600-5867