

Research on the amount of vitamins in the rabbit meat and their effect on the human body

I.D. Atakhodjaeva

Tashkent Institute of Chemical Technology, Tashkent, Uzbekistan.

Corresponding author: inoyatatakhodjaeva@gmail.com

Abstract: Numerous global research attest to the health advantages of rabbit meat. Rabbit meat has a vitamin and mineral makeup that is essentially unmatched by any other meat. Thus, rabbit meat contains significantly more vitamins B6, B12, and PP than beef, lamb, and pork. It contains a lot of iron, phosphorus and cobalt, and there is a sufficient amount of manganese, fluorine and potassium. At the same time, rabbit meat is low in sodium salts, all this suggests that rabbit meat is a dietary product. Considering its high biological value, rabbit meat is the best choice for people prone to food allergies, diseases of the gastrointestinal tract, and biliary tract, fat metabolism disorders, diabetes, hypertension and atherosclerosis. It is identified that vitamin B4 has the highest value of vitamin available in rabbit meat while B12 is the lowest value vitamin available in rabbit meat. Rabbit meat is rich in protein and low in fat therefore, rabbit meat is the suitable criteria to include in the diet who like lean meat for their consumption

Keywords: rabbit meat, beef, lamb, vitamin analysis, health impact. Therefore

Introduction.

Meat quality is a multifaceted notion that is often evaluated using a combination of experimental measurements of raw or cooked meat properties, scores assigned by a trained taste panel, and muscle features verified chemically and histologically [1].

Water-holding capacity, color evaluation on the surface of fresh-cut muscle, cooking loss, and pH measurement the day after slaughter are the traditional components that determine the meat's technological and culinary quality. Recent evidence clearly indicates that the primary factors influencing customer choice are sensory attributes [2-4].

But customers often consider so-called "white meats," such as rabbit meat, to be a little healthier. Lean, readily digested, and abundant in physiologically useful proteins, rabbit meat also has large concentrations of long-chain unsaturated fatty acids, of which linoleic acid is the main component, and necessary amino acids[5-7].

The fatty acid profile of rabbit meat is influenced by several factors, including age, sex, and breed. However, the primary factor influencing the fat structure of the meat is the diet that the animals are fed. Meat's fatty acid composition may be improved quite fast and efficiently by suitable nutrition [8-10].

Meat is an essential component of a healthy, balanced diet and has played a major role in human evolution due to its high nutritional content. This study looks at several negative stereotypes about meat eating and tries to summarize the function and significance of meat in human nutrition [11-13]. Meat has high levels of protein, iron, zinc, selenium, phosphorus, and vitamin B12. It also contains extra B complex vitamins [14].

Despite their diversity, all B vitamins have one thing in common: they help improve metabolism in the human body and normalize the functioning of the immune and nervous systems.

The number of vitamins available in meat will determine the need of the human body's essential nutrient requirement whether it can be taken from diet or from the meat itself [15,16].

Therefore, the study focuses on the vitamins available in different meat products such as rabbit meat, lamb and meat and to determine the nutrient availability for human consumption.

Materials and method

The rabbit meat, lamb and beef were purchased from the local market in Uzbekistan and transported through a chilled box until reached the laboratory.

The meat samples were prepared as per the method given in the AOAC method and sample preparation was done in a laboratory environment with hygienic practices. It will reduce the amount of changes in the meat during the preparation and processing of samples.

The prepared finished product from rabbit meat was verified in laboratory conditions using chromatography and spectroscopy [17]. Fat content was analysed by the Soxhlet method, protein content was analysed by using the Kjeldhal method and the moisture content was measured by oven drying method as explained in the previous research [10-18]. Also determined is the vitamin composition that is different from other types of meat. All analyses were done in the laboratory scales with three replicates. Data is presented in the form of tables.

Results and discussion

All these vitamins are water-soluble and are quickly eliminated from the body without accumulating in it. This means that it is necessary to replenish their reserves by taking special vitamin complexes and not forgetting about foods rich in these substances.

To compare the indicators in Table 1, in addition to the composition of rabbit meat, the composition of beef and lamb is also indicated (based on 100 g).

It shows that the water content in all the meats is not significantly different because almost all the samples have the same amount of water content in the mat samples.

Table 1. The composition of rabbit meat, beef and lamb

Composition	Rabbit meat	Lamb meat	Beef
Water	66.7 g	67.3 g	64.5 g
Protein	21.1 g	15.6 g	18.6 g
Fats	10.8 g	16.3 g	16 g
Cholesterol	40 mg	-	-

In our case, the prepared finished product from rabbit meat was verified in laboratory conditions using a chromatograph. Also determined is the vitamin composition that is different from other types of meat. As you can see, there were very large quantities of B vitamins in the table below. It is identifiable that rabbit meat is richer in protein (21.1g) than all beef and lamb samples which shows that the consumption of rabbit meat will give comparatively high protein than all

other meats but it has less amount of fat (10.8 g) than the beef and lamb which shows that the consumption of rabbit meal will reduce the heat problems and cholesterol profiles in human.

Not only that nowadays girls like to eat lean meat which is a trend in the market, therefore, rabbit meat is the suitable criteria to include in the diet who like lean meat for their consumption [19,20].

Table 2. Vitamin content in the canned food from rabbit meat, beef and lamb

Type of vitamin	Rabbit meat	Beef	Lamb
Retinol	0.01 mg	0.01 mg	0.01 mg
Vitamin B1, thiamine	0.12 mg	0.24 mg	0.12 mg
Vitamin B2, riboflavin	0.18 mg	0.38 mg	0.18 mg
Vitamin B4, choline	116.9 mg	185.4 mg	115.6 mg
Vitamin B6, pyridoxine	0.48 mg	1.071 mg	0.48 mg
Vitamin B9, folate 7	7.7 µg	89.7 µg	7.7 µg
Vitamin B12, cobalamin	4.3 µg	4.3 µg	4.3 µg

Table 2 clearly explains that the amount of Retinol, the vitamin is almost the same in all types of meat while having vitamins B1 and B2 which is higher in beef than rabbit meat and lamb. Vitamin B4 level is higher (185.4 mg) in beef followed by rabbit meat (116.9 mg) and lamb(115.6 mg).

Conclusion

It is identified that vitamin B4 has the highest value of vitamin available in rabbit meat while B12 is the lowest value vitamin available in rabbit meat. Rabbit meat is rich in protein and low in fat therefore, rabbit meat is the suitable criteria to include in the diet who like lean meat for their consumption

References

1. Gerlach, B. M. (2014). The effects of exercise on beef cattle health, performance, and carcass quality; and the effects of extended ageing, blade tenderization, and degree of doneness on beef aroma volatile formation. Kansas State University.
2. Hernandez, P., & Gondret, F. (2006). 5.1. Rabbit meat quality. Recent advances in rabbit sciences, 269.

3. Arvanitoyannis, I. S., Kotsanopoulos, K. V., & Savva, A. G. (2017). Use of ultrasounds in the food industry– Methods and effects on quality, safety, and organoleptic characteristics of foods: A review. Critical reviews in food science and nutrition, 57(1), 109-128.
4. Zavadlav, S., Blažić, M., Van de Velde, F., Vignatti, C., Fenoglio, C., Piagentini, A. M., ... & Putnik, P. (2020). Sous-vide is a technique for preparing healthy and high-quality vegetable and seafood products. Foods, 9(11), 1537.
5. consumers tend to view so-called 'white meats', including rabbit meat, as a somewhat healthier option. Rabbit meat is lean, easily digestible rich in biologically valuable proteins and contains high levels of essential amino acids
6. Vaclavik, V. A., Christian, E. W., Vaclavik, V. A., & Christian, E. W. (2014). Meat, poultry, fish, and dry beans. Essentials of food science, 133-172.
7. Rifky, A. L. M., Irfeey, M., & Mohamed, M. S. I. (2018). A case study: investigation of goat farming systems in the Gampola area in Kandy district.

8. Wood, J. D., & Enser, M. (1997). Factors influencing fatty acids in meat and the role of antioxidants in improving meat quality. *British Journal of Nutrition*, 78(1), S49-S60.
9. Wood, J. D., Enser, M., Fisher, A. V., Nute, G. R., Sheard, P. R., Richardson, R. I., ... & Whittington, F. M. (2008). Fat deposition, fatty acid composition and meat quality: A review. *Meat Science*, 78(4), 343-358.
10. Dissanayake, K., Rifky, M., Jesfar, M., Makhmayorov, J., Rakhimkulov, S., Abdullayev, B., & Samadiy, M. (2023, November). Development of Technology to Incorporate Curry Leaves (*Murraya Koenjii*) to Develop Functional Chicken Sausage and Evaluation of Chemical Properties. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1275, No. 1, p. 012008). IOP Publishing.
11. Pereira, P. M. D. C. C., & Vicente, A. F. D. R. B. (2013). Meat nutritional composition and nutritive role in the human diet. *Meat Science*, 93(3), 586-592.
12. Kumara, K., Rifky, M., & Samadiy, M. (2023). Application and regulation of nitrate and nitrite in manufacturing of chicken sausage. *Theoretical and experimental chemistry and modern problems of chemical technology*, 1(01).
13. Chiles, R. M., & Fitzgerald, A. J. (2018). Why is meat so important in Western history and culture? A genealogical critique of biophysical and political-economic explanations, *Agriculture and human values*, 35, 1-17.
14. Ahmad, R. S., Imran, A., & Hussain, M. B. (2018). Nutritional composition of meat. *Meat science and nutrition*, 61(10.5772), 61-75.
15. De Smet, S. (2012). Meat, poultry, and fish composition: Strategies for optimizing human intake of essential nutrients. *Animal Frontiers*, 2(4), 10-16.
16. Rifky, A. L. M. (2016). A study to identify the factors affecting the profitability of contract broiler chicken producers in the poultry belt of Sri Lanka. *IRA-International Journal of Applied Sciences*, 5(3), 155-160.
17. Dissanayake, K., Rifky, M., Jesfar, M., Makhmayorov, J., Rakhimkulov, S., & Abdullayev, B. (2023, November). Technology Development to Measure Chemical and Oxidative Stability of Edible Oils Using Fourier Transform-Infrared Spectroscopy. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1275, No. 1, p. 012007). IOP Publishing.
18. Rifky, M., Jesfar, M., Dissanayake, K., Orif, U., & Samadiy, M. (2024). Production of yoghurts with the addition of microencapsulated cinnamon, garlic and cumin oil with corn oil. In *E3S Web of Conferences* (Vol. 480, p. 03014). EDP Sciences.
19. Ataxodjayeva, I. D., Akramova, R. R., Rifky, M., & Dissanayake, K. (2023). Study of mineral substances in easily digestible rabbit meat. In *Uz-Conferences* (Vol. 1, No. 1, pp. 90-93).
20. Wu, T., Liu, R., Zhang, L., Rifky, M., Sui, W., Zhu, Q., ... & Zhang, M. (2022). Dietary Intervention on Depression- A review. *Food & Function*. 13, 12475-12486.