

Nutritional importance of animal byproducts

Oana Georgeta Rijnoveanu, Dana Bogdănescu, Adrian Riviș*

¹ Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Faculty of Food Processing, Calea Aradului 119, Timisoara 300645, Romania.

Received: 01 November 2017; Accepted: 02 December 2017

Abstract

The paper examines in turn consumer demand for fresh and nourishing products, the application of new processing technologies to meet consumers demands as well as the nutritional value of meat products. The article focuses more on the nutritional importance of meat products based on animal by-products. The article contradicts the notion that these by-products of animal origin can not be fully utilized in order to obtain a food product. The conclusion is that both meat by-products and their products are a real source of precious nutritional and therapeutic factors, the protein nutritional value being much higher than that of meat.

Keywords: By-product, nutritional value, protein content

1. Introduction

With an increasing world population, there is a substantial increase in the demand for high-quality protein, which makes the meat sector face a fantastic but challenging century.

Demand for meat will increase in the long run, so that the meat industry will play an important role in the development of new technologies. To ensure the need for protein, meat from different animals is not sufficient, but also secondary parts (eg high-fat meat by-products) are important. The US believes that what is produced from the animal, with the exception of processed meat, is a by-product. Thus, in the US, meat by-products are divided into two categories: edible and inedible.

In order to be used in the meat industry, these by-products are separated, chilled and subsequently processed in accordance with the conditions imposed by law. In commercial practice in the UK, organs are divided as follows:

- ✓ in red: head, lungs, tongue and tail
- ✓ in white: fat [4].

Meat products are an excellent source of complete protein. Complete proteins are proteins that contain all the amino acids that the body needs to function properly. Proper protein intake is important for the healthy production of muscles, bones, skin, hair, blood, organs and glands. The body also uses proteins to repair damaged cells and to make other new cells.

The nutrient content of the by-products is generally richer than lean meat with high iron, copper and certain B vitamins, the liver being a particularly rich source of vitamins A, B1, B2, B6, B12, niacin. The kidneys are a rich source of B1, B2 and B12: the pancreas is a good source of B1, B2, C. Vitamin C from the lungs, spleen and thymus is usually present in a sufficient amount so it can withstand the thermal treatment applied cooking.

Other types of by-products comparable to lean meat are a good source of vitamins, as well as all meat products are good sources of zinc and iron, but the liver, lungs and spleen are particularly rich in iron. [1].

Ears and legs have a high protein content, but much of this is collagen with low nutritional value, although in the case of consumption this does not have a negative effect on the quality of the protein needed by the human body.

The kidney is also a good source of vitamin B6, B12 and folic acid. A portion of 100 g of pork or beef liver contributes 450% - 1,100% of vitamin A RDA, 65% of vitamin B6 daily requirement, 3,700% of vitamin B12 DZR, and 37% of ascorbic acid DZR. Lamb's kidneys, pork, liver, lungs and spleen are an excellent source of iron, as well as vitamins. However, the highest level of phosphorus (393-558 mg / 100 g) and potassium (360-433 mg / 100 g) of meat by-products is found in the thymus and pancreas [2,3].

The purpose of this paper is to highlight the nutritional importance of animal by-products. Proteins are basic components that provide nutritional value to foods. Therefore, the quality of food is appreciated, primarily by their protein content.

2. Materials and methods

To identify the protein content were subjected to the analysis of samples of pork liver, pork spleen, pork kidney and pork heart.

We determined the protein by applying the Kjeldahl method.

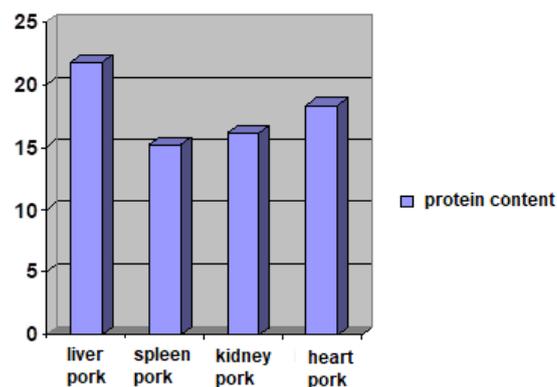
The following reagents were used:

- pentahydrate copper (II) sulphate
- potassium sulphate, anhydrous
- sulfuric acid, density 1.64 g / ml
- sodium hydroxide, decarbonated solution, containing about 33 g of sodium hydroxide for 100 g of solution
- boric acid, solution
- hydrochloric acid, titrated with 0.1 N solution
- indicator, solution: mixed indicator (red methylene blue methylene).

For the evaluation of the protein content of the by-products analyzed, proceed as follows: Homogenize the sample by passing it at least 2 times through the chopping machine.

The sample shall be kept in a hermetically sealed container, fully filled and stored in such a way as to avoid any alteration or alteration of its composition. Add 25 ml of sulfuric acid to the Kjeldahl flask. Gently mix the solution. Place the balloon in a sloping position on the heating surface. Heat slowly until foam formation ceases. Heats heavily by turning the glass periodically until the liquid is clear and has a clear blue-green tinge. Keep the hot liquid for about 90 minutes. Cool the flask to 40 degrees and pour 50 ml of water carefully. Stir and allow to cool. In a conical flask add 50 ml of boric acid and 4 drops of mixed indicator using a graduated test tube, mix, then place the liquid under the refrigerant of the distillate so that the end of the wells gets into the liquid. Start distillation until 100 ml of distillate is collected. Titrate the distillate with 0.1 N hydrochloric acid, in the presence of greenish green to blue ash. (According to ISO 937: 1978, replaces STAS 9065 / 4-81).

Results



4. Conclusions

Following studies on the nutritional value of the by-products analyzed, the following conclusions can be drawn:

- the samples analyzed have significant protein concentrations;
- the highest concentration of protein was identified in the pig liver sample, 21.81% ;
- As a result of these important values, I recommend the use of animal by-products in the production of meat products, thus removing the use of protein mixtures.

Compliance with Ethics Requirements. Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human / or animal subjects (if exist) respect the specific regulation and standards.

References

1. Aidos I, A-van-der P, Boom RM, Luten JB. Upgrading of maatjes herring byproducts: production of crude fish oil. *J Agric Food Chem.* **2001**, 49(8):3697–3704.
2. Devatkal S, Mendiratta SK, Kondaiah N. Quality characteristics of loaves from buffalo meat, liver and vegetables. *Meat Sci.* **2004**, 67(2):377–383
3. Devatkal S, Mendiratta SK, Kondaiah N, Sharma MC, Anjaneyulu ASR. Physicochemical, functional and microbiological quality of buffalo liver. *Meat Sci.* **2004**, 68(5), 79–86.
4. Schrieber R, Seybold U. Gelatine production, the six steps to maximum safety. *Developments in Biology Standards.* 1993