

## PORK AND BOVINE LIVER IMPORTANT SOURCES OF NUTRIENTS

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**Abstract.** This study includes the methodology of obtaining the functional products with high nutritional value. Nutritional quality of food is determined by: the content and quality of carbohydrates, proteins and lipids, content of soluble and fat soluble vitamins, mineral content and, as well, the content of biologically active substances. This article includes a study use of pork and beef liver to diversification range production. It was found that the nutritional indicators as VN10, CS, EV in liver are almost identical to those in meat, in some cases even higher, being influenced by many factors: variety, age, anatomical part, animal's nutrition. It was found that liver is an important raw material in terms of nutritional quality and can be used to diversify the products with the optimized values. It showed the correlation nutritional indicators as VN10, CS, EV in liver based products.

**Key Words:** nutritional value, pork liver, bovine liver, nutritional indicators VN10, CS, EV

### I. Introduction

Nutritional quality of food is determined by: the content and quality of carbohydrates, proteins and lipids, content of soluble and fat soluble vitamins, mineral content and, as well, the content of biologically active substances [1, 11].

This paper present the evaluation, based on bibliographic and experimental study of the nutritional value of meat and liver of bovines/porcins. Was studied the chemical composition and nutritional value of raw materials. Nutrition index (VN<sub>10</sub>), chemical score (CS) and the energy value was calculated. It was found that bovine and porcine liver are interesting in terms of nutrition, economics, serving as raw material for food diversification with improved nutritional value.

### II. Materials and methods

Tested products: swine meat, swine liver, bovine meat, bovine liver purchased from supermarket.

The study of nutritional value was conducted on the bibliographical study of the chemical composition of products mentioned above [1-11].

The assessing of VN10 in tested samples was carried out in the formula suggested by the nutritionist F. Strimska [9, 10].

The energy value of food (100g) is achieved by the relation:

$$VE = 4.1 \times (\% Pr) + 9.3 \times (\% L) + 4.1 \times (\% G), Kcal / 100g \quad (1)$$

Where:

Pr, L and C are the percentage content of proteins, lipids and carbohydrates in food.

The evaluation of protein quality was performed using methods standardized and approved by the International Committee of FAO and WHO. In tested products were assessed the chemical index (CS – chemical score), according to the formula [9, 11], using the Excel program.

The interdependence between the indexes VN10, CS, VE was determined through Excel program, using the Pearson function ( $r^2$ ).

### III. Results and discussion

In Figures 1 and 2 shows average content of protein, fat, ash meat and liver of bovine/pork.

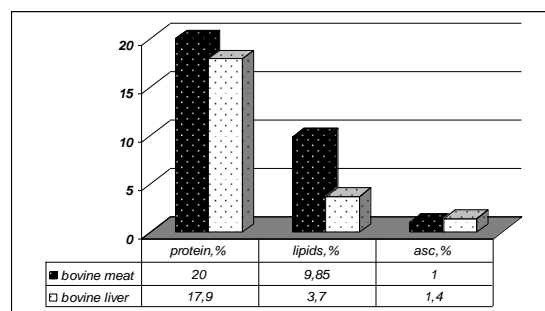


Figure 1. The chemical composition of bovine meat and bovine liver

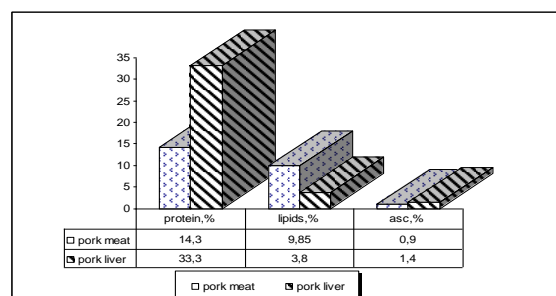


Figure 2. The chemical composition of pork meat and pork liver

The data presented in table 1 and table 2 shows that meat and liver represent important sources of macro and micronutrients [5-10]. The nutritional value of liver is almost identical to the meats, except the content of essential amino acids, B vitamin complex and the content of I<sub>2</sub> and Fe, where the liver is a leader [1 – 4, 9-11].

**Table 1.** The content of nutrients in the chemical composition of products

Macro and micro nutrients	Bovine		Pork		Standard Protein FAO/ WHO g/100g protein
	meat	liver	meat	liver	
Protein, g/100g	20,0	17,9	14,3	18,8	-
Lipids, g/100g	9,8	3,7	33,3	3,8	-
Carbohydrate, g/100g	1,0	5,3	0,9	4,7	-
Ca, mg/100g	10	9	7	9	-
P, mg/100g	200	314	164	347	-
Fe, mg/100g	2,9	6,9	1,7	20,2	-
Vitamin A, mg/100g	traces	9,2	traces	3,45	-
Vitamin B <sub>1</sub> , mg/100g	0,07	0,3	0,52	0,3	-
Vitamin B <sub>2</sub> , mg/100g	0,18	2,19	0,14	2,18	-
Vitamin C, mg/100g	traces	33	traces	21	-
Valine	1,15	1,25	1,14	1,25	5
Isoleucine	0,94	0,93	0,97	1,00	4
Leucine	1,62	1,59	1,54	1,76	7
Lysine	1,74	1,43	1,63	1,49	5,5
Methionine + Cysteine	0,90	0,756	0,76	0,77	3,5
Threonie	0,88	0,81	0,96	0,92	4
Triptophan	0,27	0,24	0,27	0,31	1
Fenilamină + Tyrosine	1,70	1,66	1,51	1,68	6
Total essential amino acids	9,20	8,67	8,77	9,28	36

**Table 2.** The VN<sub>10</sub>, CS, VE indicators and Pearson correlation of meat and liver of swine and bovine

Product analyzed	VN <sub>10</sub>	VE, kcal / 100g	CS, %	Pearson correlation
Bovine meat	20,19	124,55	9,2	VN <sub>10</sub> = f (CS); r = 0,51954
Bovine liver	59,46	328,91	8,7	VN <sub>10</sub> = f (VE) r = 0,41829
Pork meat	19,27	339,27	7,7	VN <sub>10</sub> = f (VE) r = 0,635524
Pork liver	56,69	117,34	9,4	VN <sub>10</sub> = f (VE) r = 0,44812

#### IV. Conclusions

In this paper we have realized a bibliographic study of chemical composition of meat and liver of swine and bovine, from which it was found that the meat and liver presents important sources of macro and micro nutrients, in some cases the content of such elements as Fe, I<sub>2</sub>, essential amino acids is higher in liver than in meat.

It was found that the nutritional indicators as VN<sub>10</sub>, CS, EV in liver are almost identical to those in meat, in some cases even higher, being influenced by many factors: variety, age, anatomical part, animal's nutrition.

It was found that liver is an important raw material in terms of nutritional quality and can be used to diversify the products with the optimized values.

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