

STUDYING THE INFLUENCE OF YEAST PREPARATION FROM *SACCHAROMYCES CEREVISIAE* ON PIGS AGEING AND MEAT QUALITY
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ABSTRACT: The influence of ageing yeast stimulator from the species *Saccharomyces cerevisiae*, developed by the authors, on weight development and feed consumption per 1 kg weight increment of pigs for fattening is studied. The preparation is used on quantity of 250 g per 1000 kg feed mixture. The tested yeast preparation has shown biological activity, expressed in increasing of average daily weight increment, decrease of feed consumption per 1 kg weight increment and increase of animals' appetite. The effect of the preparation on some parameters, characterizing the meat quality is also examined. The chemical composition, pH values at 45 min and 24 h post mortem and colour of meat samples from *m.Longissimus dorsi* are studied. A difference, regarding the examined parameters between tested and control samples, is not established. There is carried also the assessment of the carcass according the parameters: weight, carcass yield, fat thickness, *m.Longissimus dorsi* area, weight of head and skin.

INTRODUCTION: In order to carry out the regular course of the metabolic processes in the animal organism, it is necessary the feed rations to be supplemented with biological-active compounds - ageing stimulators, which influence on the further increase of animals' productivity. In the countries with developed stock-breeding 50% to 80% of the used feeds contain biological-active compounds /Weis, 1983/. Among the sources of such a substances, used in different fields of agriculture, food and microbiological industry, a prominent position is taken by the preparations, received from yeasts /including the preparations from *Saccharomyces cerevisiae*/. Yeasts, yeast extracts, autolyzates and hydrolyzates are used as components of different feed mixtures, culture media, stimulating the microorganisms' growth, increasing the ferments and organic acid production /Baranova, 1980/. The cause for the wide use of yeasts from the species *Saccharomyces cerevisiae* in the human medicine as well, is their safety /Naumenko, 1985; Miyada, 1979/. The objective of our study is to examine the biological activity of prepared from us yeast preparation /1/ from the species *Saccharomyces cerevisiae* on the weight development of fattening pigs and some of the main carcass parameters and meat quality.

MATERIALS AND METHODS: A bilinear pig hybrid "Cambarow" was used for conducting the test: the control and test groups were formed according to analogs' method, sex and live weight equalized. The pigs were fed abundantly. The animals in the two groups received feed with equal composition, that was up to the standard requirements. The yeast preparation was added to the test group rations in quantity of 250 g per 1000 kg feed. After the end of the fattening period /123 days/, we performed the carcass assessment according to the parameters:

carcass weight, carcass yield, fat thickness, m.Longissimus dorsi area, head and skin weight. We determined m.Longissimus dorsi area with cross-section of the muscle after the last thoracic vertebra. The fat thickness was measured in the region of the most slender part over the m.gluteus medius. After killing we took meat samples from the left carcass side from m.longissimus dorsi in the region of the last thoracic vertebra. We trimmed the muscle from surface fasciae and sinews. Till the moment of the analysis we preserved the muscle in freezer at 0°-6°C. The chemical composition was established by analyzer Technicon InfraAnalyzer 400 of the firm Hewlett Packard. The colour of meat was determined by the use of spectrophotometer Beckmann DK-2 with reflectoral appliance. From the spectral curves we rendered and reported the reflectance coefficients according to Hardy weighed ordinates. We calculated the values of x, y and z. The parameters L, a₁, b₁, that were of Hunter colour system, were drawn from the values. The determination of the hydrogenionic concentration was carried out by pH-meter Pracitronic MV-86, and pH values were determined at 45 min and 24 h post mortem.

RESULTS AND DISCUSSION: In table 1 are presented the data of live weight at the beginning and at the end of the fattening, the test duration, average daily increment in periods and in total. The average daily increment increases in tested pigs with 10,7%, as compared with the control group. At the end of the test, the live animal weight from the tested group is significantly higher than the live animal weight from the control group. This gives us grounds to note, that the yeast preparation in the quantity in which is used, influences positively the average daily increment, live pigs' weight, respectively.

Table 1.--Parameters of ageing

n = 6

PARAMETERS	Groups				
	Control		Tested		
	\bar{x}	$\pm S\bar{x}$	\bar{x}	$\pm S\bar{x}$	P
Live weight /kg/					
- at the beginning of the test	21,16	0,59	20,72	0,37	-
- at the end of the first period	50,88	1,43	52,41	1,22	-
- at the end of fattening	99,41	2,05	107,35	1,56	++
- % toward control group	100,0		107,99		
Increment Total /kg/	1565		1733		
Average daily increment /kg/					
- at the end of the first period	560		597		
- at the end of the second period	693		784		
- for fattening in total	636		704		
- % toward control group	100,0		110,69		

Table 1.- Cont.

n = 6

PARAMETERS	Groups				P
	Control		Tested		
	\bar{x}	$\pm S\bar{x}$	\bar{x}	$\pm S\bar{x}$	
Periods duration /days/					
- first period	53		53		
- second period	70		70		
- for fattening in total	123		123		

++ $p < 0,01$ - $p > 0,05$

The tested animals have had enhanced appetite also /table 2/. In general, during the fattening period the average daily feed consumption for them is with 4,16% higher, and the feed consumption per 1 kg increment is with 5,98% lower.

Table 2.-Feed consumption during fattening

n = 20

PARAMETERS	Groups	
	Control	Tested
Accepted feed for fattening in total /kg/	5557	5788
In % toward control group	100,0	104,2
Average daily accepted feed /kg/		
- for the first period	1,626	1,693
- for the second period	2,738	2,852
- for fattening in total	2,259	2,353
Feed consumption for 1 kg increment		
- for the first period	2,900	2,831
- for the second period	3,950	3,634
- for fattening in total	3,551	3,339
In % toward control group	100,0	94,02

The quantities of used preparation during this test /250 g per 1000 kg feed/ and the received results give us grounds to accept, that the yeast preparation from the species *Saccharomyces cerevisiae* contain biological-active ageing factors, which accelerate the ageing and improve the feed utilization at pigs for fattening, which nature unfortunately we still do not know. The studies of Lima /1983/ confirm our suppositions. At the parameters, characterizing the carcass value /weight, carcass yield, fat thickness, m.longissimus dorsi area, head and skin weight/ statistically proved differences are not observed between the tested and control group /table 3/. The higher average weight and the greater fat thickness in the tested group is logical according to the

higher live animal weight. These results give us grounds to remark, that the tested preparation does not influence negatively the carcass value. In conformity with this are also the investigations of Miyada /1979/, Moreira /1984/, Veum /1975/, who are used yeasts from the species *Saccharomyces cerevisiae* in pigs' rations and are achieved the same result.

Table 3.-Slaughter results analysis n = 10

PARAMETERS	Groups				
	Control		Tested		P
	\bar{x}	$\pm S\bar{x}$	\bar{x}	$\pm S\bar{x}$	
Carcass weight /kg/	67,02	1,52	72,30	2,32	-
Carcass yield /%/	67,42	0,53	67,35	0,62	-
Fat thickness /mm/	26,50	1,38	30,20	1,90	-
m.longissimus dorsi area	28,93	1,28	33,20	1,85	-
Heads /kg/, in %	4,52		5,02		
toward the carcass weight					
/%/	6,67	0,41	6,94	0,18	-
Skins /kg/	6,84		7,09		
toward the carcass weight					
/%/	10,20	0,24	9,81	0,35	-

- $p > 0,05$

The received results about the meat chemical composition, presented in table 4, show, that there is not statistically proved difference in protein, water, fat and mineral level in the tested samples between the tested and control groups.

Table 4.-Chemical analysis of the meat of m.longissimus dorsi n = 10

PARAMETERS	Groups				
	Control		Tested		P
	\bar{x}	$\pm S\bar{x}$	\bar{x}	$\pm S\bar{x}$	
Water content, %	74,99	0,23	75,17	0,22	-
Protein, %	23,70	0,35	23,44	0,22	-
Fats, %	1,80	0,18	1,85	0,17	-
Minerals, %	1,18	0,03	1,18	0,02	-
Dry substance, %	25,01	0,25	24,83	0,28	-

- $p > 0,05$

There are not also established differences, regarding ph values at 45 min and 24 h post mortem /table 5/, which show, that the post mortem biochemical processes in the muscles are normally

carried out and there are not any data for deviations, which can lead to meat quality variations.

Table 5.-pH value of m.longissimus dorsi at 45 min and 24 h post mortem n = 10

PARAMETERS	Groups				P
	Control		Tested		
	\bar{x}	$\pm S\bar{x}$	\bar{x}	$\pm S\bar{x}$	
- pH at 45 min	6,15	0,07	6,14	0,09	-
- pH at 24 h	5,58	0,04	5,59	0,03	-

- $p > 0,05$

The arithmetical mean values of the parameters: L /characterizing colour brightness/, a_1 /determining the share of the red colour/, b_1 /determining yellow colour share/ and $\arctg a_1/b_1$ for the tested and control samples are without statistically proved differences between themselves /table 6/.

Table 6.-Characteristic of the meat colour of m.longissimus dorsi n = 10

PARAMETERS	Groups				P
	Control		Tested		
	\bar{x}	$\pm S\bar{x}$	\bar{x}	$\pm S\bar{x}$	
L - colour brightness	60,95	1,43	60,37	1,98	-
A ₁ - red colour share	14,86	1,93	11,75	1,45	-
B ₁ - yellow colour share	11,38	0,40	10,51	0,82	-
Arctg a ₁ /b ₁ hue	52,55	1,92	48,19	2,31	-

- $p > 0,05$

The results for the studied parameters /chemical composition, colour and pH/ show, that the yeast preparation does not influence negatively the meat quality. The similar conclusion is drawn by the authors Simakova /1980/, Cantoni /1977/ et al.

CONCLUSIONS: The yeast preparation from the species *Saccharomyces cerevisiae*, prepared by us, and added to the pigs' rations in quantity 250 g per 1000 kg feed, displays biological activity, expressed in: increase of average daily increment, feed consumption decrease per 1 kg increment and enhancement of animals' appetite. The preparation does not reduce the meat quality.