

CONNECTION BETWEEN THE PERCENTAGE OF BONES, MUSCLE AND FAT  
TISSUE OF SWINE CARCASSES

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**SUMMARY:** Correlations of sharing percents of bones with share of muscle and fat tissue in pig carcasses were studied. Dissection of carcasses of 87 pigs into their main parts and tissues was performed. Correlation coefficients among the certain mean values were calculated. Positive correlation coefficient was found between the share percentage of bones and muscle tissue of the carcasses ( $r = 0.365^{**}$ ); the regression coefficient "b" was 1.604. Correlation coefficient between the portion of bones and fat tissue of the carcasses was negative ( $r = -0.614$ ), whereas the regression coefficient "b" was -3.472.

**INTRODUCTION:** During last few decades, the habits of the consumers have changed considerably, meaning that requirements have increased for meat with lowest possible fat content, and particularly of pork meat. Therefore, the aim of pig breeding was primarily based on the results of the ratio between the muscle and fat tissue in pig carcasses, i.e. to increase the level of meat. However, not many studies on the portion of bones in carcasses have been written up to now and there are still less available studies in which the results of correlations between the portion of bones, muscle and fat tissue were analyzed. That is why in this study our attention was drawn primarily to this problem.

**MATERIALS AND METHODS:** The examination was carried out on 87 refrigerated pig carcasses, averagely weighing 38.07 kg. Dissection was performed using the Weniger's method modified in such a way that total portions of certain tissues did not include the muscle tissue of "hamburger-bacon" (Petričević et al. 1985). Dissection into the main parts was performed (ham, shoulder-point, neck, back, breast-cut and less valuable parts) and each part was separated into muscle, fat tissue and bones. The total mean portion of muscle tissue in carcasses amounted to 56.93%. When "hamburger-bacon" (a part of breast-out area) was excluded, it amounted 49.54%. Data were put through a computer using the SPSS program.

**RESULTS AND DISCUSSION:** The portion of certain parts of carcasses, and their tissues, and the correlations between the share percentage of bones and muscle tissue on the one hand, and bones and fat tissue, both from the carcasses, on the other, are shown in Tables 1 and 2.

Table 1.- Portions of main parts and tissues in pig carcasses

Part of carcasses			Ham	Shoulder -joint	Back	Neck	Breast -cut
Total weight	kg	$\bar{x}$	10.64	5.71	7.37	2.99	6.52
		s	0.67	0.35	0.58	0.35	0.50
	%	$\bar{x}$	27.95	15.00	19.34	7.86	17.14
		s	1.39	0.79	1.23	0.84	1.21
Bones	kg	$\bar{x}$	1.26	0.81	1.16	0.45	0.35
		s	0.12	0.06	0.17	0.08	0.06
	%	$\bar{x}$	3.32	2.13	3.03	1.17	0.91
		s	0.33	0.18	0.40	0.21	0.16
Muscle tissue	kg	$\bar{x}$	7.25	3.88	4.45	2.05	1.24 <sup>a)</sup>
		s	0.74	0.28	0.44	0.24	0.18
	%	$\bar{x}$	19.03	10.20	11.68	5.39	3.25
		s	1.78	0.66	1.06	0.59	0.45
Fat tissue	kg	$\bar{x}$	2.13	1.02	1.76	0.49	0.67 <sup>a)</sup>
		s	0.38	0.22	0.45	0.12	0.19
	%	$\bar{x}$	5.60	2.66	4.63	1.30	1.75
		s	0.99	0.56	1.17	0.31	0.19

a) Breast-cut area excluded muscle and fat tissue of "hamburger-bacon" (4.26 kg or 11.22%)

The results shown in Table 1 indicate a relatively favourable ratio among the portions of certain parts of carcasses under observation (ham 27.95%, back 19.34%). Data about the portion of muscle tissue in certain parts of carcasses are rather satisfactory with regard to the mass of carcasses. These findings agree in general with those of Jensen et al. (1967), Petričević et al. (1985), Kralik et al. (1988) and Brundza et al. (1989).

Table 2.-Correlation (r) among the share percentage of bones and muscle tissue, and bones and fat tissue in pig carcasses

Indicator	x <sub>2</sub>	x <sub>3</sub>	x <sub>4</sub>	x <sub>5</sub>	x <sub>6</sub>	x <sub>7</sub>	x <sub>8</sub>
x <sub>1</sub> Bones from carcasses	0.803**	0.715**	0.682**	0.370**	0.498**	0.365**	-0.614**
x <sub>2</sub> Bones from ham	/	0.678**	0.263**	0.201	0.396**	0.345**	-0.560**
x <sub>3</sub> Bones from shoulder-joint		/	0.304**	0.051	0.327**	0.292**	-0.485**
x <sub>4</sub> Bones from back			/	0.012	0.099	0.205	-0.367**
x <sub>5</sub> Bones from neck				/	0.098	0.038	0.114
x <sub>6</sub> Bones from breast-cut					/	0.277**	-0.394**
x <sub>7</sub> Muscle tissue of carcasses						/	-0.918**
x <sub>8</sub> Fat tissue of carcasses							/

\*\* P < 0.01

The results shown in Table 2 indicate that the correlation between the share of bones of the carcasses and certain parts of carcasses, as well as between them and the share percentage of muscle tissue of the carcasses was always significant (P < 0.01). From the results of regression equation ( $y = 34.78 + 1.604 x$ ), it can be concluded that an increase in portion of bones leads to an increase in the share percentage of muscle tissue. The correlation between the share percentage of fat tissue in carcasses was always negative, and significance (P < 0.01) was determined in all cases except for the portion of neck bones in carcasses. The regression equation  $y = 44.85 + (-3.472) x$  indicates that the share percentage of fat tissue in carcasses decreases with an increase in portion of bones and muscle tissue, and bones and fat tissue of the carcasses were determined by Kempster and Evans (1981), Fortin et al. (1987) and Siemens et al. (1989).

**CONCLUSIONS:** From the results of the examination and discussion can be drawn:

- The portions of certain parts of carcasses were satisfactory, more valuable parts prevailed (ham, back),
- The portion of muscle tissue in certain parts of carcasses, especially in ham, was satisfactory,
- Correlation between the share percentage of bones from the carcasses and from certain parts was always positive and in most cases significant at P < 0.01,

- Correlation and regression coefficients between the portion of bones and muscle tissue of carcasses were positive, whereas between the portion of bones and fat tissue of the carcasses, they were negative.

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