

INFLUENCE OF ANIMAL FACTORS ON THE COMPOSITION AND NUTRITIVE VALUE OF PORK

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INTRODUCTION

THE INFLUENCE of age and sex of pigs on the composition of pork was the subject of studies of many authors /1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13/. The variation factors were most frequently only two age groups - young and mature pigs, or two sex groups. However, data concerning variation in composition and nutritive value of pork over the whole period of pig growth are not available.

MATERIAL AND METHODS

THE STUDIES were carried out on pigs of Large-White Polish breed, equally fed during the whole life, divided into 5 age groups: 4, 6, 8, 10 and 12 months, and 3 sex groups: males, females and castrates. In six muscle groups: m.longissimus dorsi /LD/, m.biceps femoris /BF/, m.semitendinosus /ST/, m.semimembranosus /SM/, picnic /P/ and boston but /B/ - the content of total protein, intramuscular fat, moisture, total and soluble collagen and water holding capacity /WHC/ was determined. PER was determined on m.longissimus dorsi.

RESULTS

THE VARIATION in the composition of pork in relation to the age of pigs are given in Table 1.

The results presented in this table indicate an increase with the age in:

- protein content, in that a significant increase of this component occurs from the 8th month animal life,
- fat content, but distinctly significant differences occur only between the 4th and 12th month of life.

With the age, however, a decrease was found in:

- the content of moisture and WHC, distinctly progressing,

Tab.1. Composition of pork in relation to age / % /

age mo.	protein	collagen	soluble collagen	fat	moisture	WHC
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$
4	18,79 [±] 1,48 a	6,02 [±] 2,50 a	1,43 [±] 0,81 a	5,08 [±] 2,73 a	75,13 [±] 1,98 a	32,39 [±] 7,00 a
6	19,31 [±] 1,51 a	5,83 [±] 2,22 a	1,20 [±] 0,81 ab	5,50 [±] 3,18 ab	73,66 [±] 2,31 b	31,61 [±] 10,18 a
8	19,90 [±] 1,54 b	5,11 [±] 2,20 a	1,25 [±] 0,77 ab	6,46 [±] 3,60 bc	72,30 [±] 2,87 c	25,91 [±] 9,34 b
10	19,95 [±] 1,48 b	5,70 [±] 2,50 a	1,03 [±] 0,77 b	6,32 [±] 3,71 ac	72,33 [±] 2,83 cd	23,48 [±] 9,58 b
12	19,89 [±] 1,63 b	6,13 [±] 2,68 a	1,02 [±] 0,78 b	7,58 [±] 3,75 c	71,30 [±] 2,74 d	19,53 [±] 7,82 c

a, b, c - means with superscript different letters differ significantly at 0,01
WHC - water holding capacity

- the content of soluble collagen, where significant differences occurred only between the 4th and 10th or 12th month of life.

The variation of the components mentioned were different in the particular muscles, and the given direction of variations occurred very distinctly in SM.

The content of total collagen did not change significantly with the age.

The variations in pork composition in relation to pig sex are given in Table 2.

The results indicate that meat of males contains significantly less fat and more moisture than that of females and castrates, between which no significant differences were found. WHC level differed only between meat of females and castrates - WHC was higher in meat of females.

The differences in the composition of particular muscles are given in Table 3. These results are given successively from the highest to the lowest values, indicating with a continuous line the absence of significant differences:

protein: LD - SM - BF - ST - P - B

total collagen: B - P - LD - BF - ST - SM

soluble collagen: B - P - LD - BF - ST - SM

Tab.2. Composition of pork in relation to sex / % /

sex	protein	collagen	soluble collagen	fat	moisture	WHC
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$
M	19,66 \pm 1,47 a	5,93 \pm 2,64 a	1,26 \pm 0,86 a	5,16 \pm 3,07 a	73,82 \pm 2,67 a	26,86 \pm 10,32 ab
F	19,56 \pm 1,58 a	5,62 \pm 2,05 a	1,08 \pm 0,75 a	6,81 \pm 3,70 b	72,23 \pm 3,03 b	24,83 \pm 9,87 a
C	19,46 \pm 1,75 a	6,07 \pm 2,55 a	1,22 \pm 0,79 a	6,58 \pm 3,53 b	72,72 \pm 2,74 b	27,92 \pm 9,92 b

M - males, F - females, C - castrates

Tab.3. Composition of pork in relation to muscle groups / % /

muscle groups	protein	collagen	soluble collagen	fat	moisture	WHC
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$
LD	21,36 \pm 1,27 a	6,12 \pm 1,74 a	1,68 \pm 0,69 a	4,42 \pm 1,85 ab	72,69 \pm 1,91 ac	28,40 \pm 8,25 a
BF	19,74 \pm 1,24 b	4,80 \pm 1,40 b	0,70 \pm 0,35 b	5,16 \pm 2,55 a	73,62 \pm 2,42 ab	28,35 \pm 8,72 a
ST	19,20 \pm 1,11 c	4,58 \pm 1,72 b	0,58 \pm 0,30 b	5,40 \pm 2,39 a	73,99 \pm 2,47 b	26,68 \pm 11,74 ab
SM	20,34 \pm 1,21 d	4,05 \pm 1,29 b	0,50 \pm 0,24 b	3,80 \pm 2,31 b	74,43 \pm 2,25 b	29,19 \pm 9,35 a
B	18,14 \pm 1,13 e	7,59 \pm 2,32 c	1,86 \pm 0,71 a	9,63 \pm 3,84 c	71,08 \pm 3,58 c	23,06 \pm 9,99 b
P	18,63 \pm 1,13 e	8,16 \pm 2,47 c	1,78 \pm 0,70 a	8,70 \pm 3,17 c	71,74 \pm 2,85 c	23,93 \pm 10,65 b

LD - m.longissimus dorsi, BF - m.biceps femoris, ST - m.semitendinosus, SM - m.semimembranosus, B - boston but, P - picnic

fat: B - P - ST - BF - LD - SM

moisture: SM - ST - BF - LD - P - B

WHC: SM - LD - BF - ST - P - B

The results presented in relation to the muscle groups examined point to distinct differentiation particularly in protein content, and to relatively smaller one of the other components. Taking into account the composition of pork, muscles SM and LD can be considered to have the highest qualitative value. In Table 4 PER is given.

Tab.4. Nutritive value /PER/ of pork - LD

age	$\bar{x} \pm SD$	sex	$\bar{x} \pm SD$
4	2,71 \pm 0,34 a	M	2,75 \pm 0,34 a
6	2,75 \pm 0,29 a		
8	2,88 \pm 0,36 a	F	2,79 \pm 0,37 a
10	2,66 \pm 0,32 a		
12	2,81 \pm 0,51 a	C	2,79 \pm 0,44 a

The results of this table indicate that age and sex of pigs do not affect the biological value of pork proteins.

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