found. However, KIRST (1985) and PAŽMOVÁ (1992) talk about significant reduction of rennetability in case of insufficient energy and surplus of nitrogenous components. The shortest average time of milk renneting during the whole pasture season was found in the 1st group of cows, followed by 3rd and then 2nd group. Statistically provable differences (+ P< 0,05) were confirmed in the 1st pasture cycle between 1st and 3rd group of cows.
The average iodine number values (JÈ) during pasture season demonstrate the influence of different nutritious feeding in individual groups of cows, when the highest value of iodine number (40,5) were gained in cows from the 1st group. Cows of the 2nd and 3rd group gained lower values of iodine number (36,53, and 36,66 respectively). Statistically provable differences (+ P< 0,05) were found during the whole pasture season between 1st and 2nd group. Statistically provable differences between these groups were also found during the 2nd pasture cycle. Dynamic changes of iodine number during individual pasture cycles are illustrated in picture 2. But it is evident that higher iodine number values were gained in the 1st group of cows, which was fed only grass from pastures. The results gained are in accordance with KRÈÁL (1990). According to him the fresh mature green forage, meadow grass cause high iodine number value and forage with high fibre content, starch or saccharose cause low values of iodine number. According to ULBERTH (1991) forage components, which support development of acetic acid in rumen metabolism and at the same time they are poor in fat, lead to development of solid milk fat (low iodine number). In case of fresh pasture grass (in dry matter 5 to10 % of lipids and low fibre content) content of acetic acid decreases.
Normal and appropriate way of nutritious feeding of cows does not have any significant influence on solidifying temperature of milk (TTM). Changes can be observed in case of inappropriately balanced ratio between energetic value of feeding dosage and protein content and mineral deficit (MICHALCOVÁ,1997, KADLEC, 2000). The gained results correspond with this when average values TTM found during pasture season, as well as in individual pasture cycles were lower in groups of cows with additional energetic forage (2 group: - 0,533 °C, 3 group: - 0,530 °C, or 1 group: - 0, 527 °C). Statistically provable differences between individual groups of cows were not found.

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THE CHOLESTEROL LEVEL OF FATTENERS' MEAT IN DEPENDENCE ON A KIND FAT IN FEED RATION

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Summary

The crossbred fatteners [♀(♀Polish Landrace x ♂Polish Large White) x ♂duroc] from body weight 40kg to slaughtering (103,5kg) were receiving complete mixtures as follows:
- experimental I - control group - without any fat

- experimental II - with 5% of the soya oil with 59,72% content of essential fatty acids
- experimental III - involving 5% the standarised fat with 38,56% content of essentaial fatty acids
- experimental IV - involving the standarised fat with 27,60% content of essentaial fatty acids.

In blood plasma of fatteners receiving the soya oil there was termed lower level of total cholesterol and HDL cholesterol and LDL cholesterol in comparison to fatteners of control group. In their ham was termed also lower level of cholesterol (40,8mg/100g tissue) in comparison to fatteneres of control group (54,17mg/100g tissue).
In longissimus dorsi muscle of fatteners receiving the soya oil or the standarised fats was temed statistically non-significant decrease in content of cholesterol.

Key words: pigs, soya oil, standarised fat, blood plasma, ham, loin, cholesterol

Introduction

The dietetic value of pig meat depends on the cholesterol level, a fat contain and particularly depends on fatty acids contain.
According to Korzeniowski et al. (1992) the level of cholesterol in longissimus dorsi of fatteners depends on breed or crossbreeding scheme. They termed the cholesterol level in longissimus dorsi as follows: Polish Large White - 44,46mg/100g tissue, Duroc - 22,94mg/100g tissue, Polish Large White x Duroc - 24,95mg/100g tissue.
Significantly higher level of cholesterol was termed in fatty tissue (backfat, liver, SADŁO).
The cholesterol level in pig meat depends not only on genetic factors. There are possibilities of decreasing the cholesterol level in pig meat due to correct feeding particularly selecting of feed contained unsaturated fatty acids.
The source of unsaturated fatty acids (which have hipocholesterolemic activity) are oils or seeds of oily plants.
The aim of this study was to term the influence of participation of standarised fat or soya oil in feed ration on the cholesterol level in muscles.

Material and methods

The studies were carried out on 40 fatteners (gilts and barrows [♀(♀Polish Landrace x ♂Polish Large White) x ♂Duroc] dividing into 4 different feeding groups (10 fatteners: 5 gilts and 5 barrows).
They were receiving complete mixture as follows:

- experimental I - control group - without any fat - feeding value: 12,62 MJ EM and 13,32% of digestible protein
- experimental II -with 5% of the soya oil with 59,72% contain of essential fatty acids (linoleic and linolenic acid) - feeding value: 14,70 MJ EM and 13,93% of digestible protein
- experimental III - involving 5% the standardised fat with 38,56% contain of essential fatty acids- feeding value was the same as the group II
- experimental IV - involving 5% the standardised fat with 27,60% contain of essential fatty acids- feeding value was the same as the group II

Fatteners from body weight 40kg to slaughtering (103,5kg) were fed *ad libitum* with the complete mixture with participation of suitable fat.
After slaughtering the meat samples were taken from the longissimus dorsi (on the dividing line of thoracolumbar vertebraes and loins) and from the muscle of semimembranosus of ham.
The cholesterol level was marked in muscles according to method of sampling given by Rhee et al. (1982).
Three days before slaughtering blood was taken from fatteners. Blood plasma was obtained after centrifuging with speed of 3000 rotations/1 minute per 10 minutes. Then it was kept in temperature -20˚C to making analyses.
Results were analysed using the SAS software (SAS/STAT 1989).

Results

The level of essential fatty acids in soya oil was amounted 59,72% and in standardised fat 27,6% and 38,56%. A participation of fatty acids which have neutral or hipocholesterolemic activity was amounted: 10,92; 8,19 and 7,3%. The total cholesterol, HDL and LDL fractions level in blood plasma are shown in table 1.
The ratio of total cholesterol to HDL cholesterol was hesitating from 2,22 (group II - with soya oil) to 2,60 (group III - with the standardised fat 38,56%).
The contain of: total choelsterol, HDL and LDL cholesterol in blood plasma was marked by using equipment of reagents POCH - Gliwice
High level of the essential fatty acids in soya oil decreased the cholesterol level in fatteners' blood plasma.
Then the cholesterol level decreased in loin and ham muscles. In ham of fatteners which received soya oil in complete mixtures - the cholesterol level was significantly lower in comparison to fatteners of control group.

Discussion

The cholesterol level in blood plasma of fatteners remained in physiological norm, which hesitates from 80 to 140mg/dl (Janik et al. 1993).
According to Janik et al. (1993) pigs' reaction to participation of fat in mash depends on breed and genotype of lipoproteides Lpb. All pigs with higher and highest level of cholesterol in blood serum have gene Lpb^5 or its mutant Lpb^8.
In own researches there was not analysed the genotype of fatteners. The sire of all the fatteners was the same, but there were different dams.
Busboom et al. (1991) and Barowicz and Pietras (1991) have not termed influence of sex of fatteners on the total cholesterol level in muscles. But Barowicz et al. (1997) giving to fatteners 8% supplement of flax seeds observed statistically non significant decrease of total and LDL cholesterol in blood serum of barrows, whereas differences in gilts' were statistically non significant.
Standardised feeding fat didn't exerted significant influence on explorated lipid index of blood serum. Whereas a participation of refined fat in feed rations for gilts caused increasing of cholesterol level in blood serum (Pietras et al. 1996).
There wasn't observed the influence of flax seeds or standardised fat in mashes on the total cholesterol level in longissimus dorsi (Barowicz and Pietras, 1998; Barowicz et al. 1997).
Chichłowska et al. (1995) and Busboom et al. (1991) didn't observed the significant influence of participation of rapeseed meal in mash on the cholesterol level in fatteners' muscles.
Ostoja et al. (1996) giving fatteners mashes with participation rolled grains of rape didn't observed the significant decreasing of total cholesterol level in tissues.
Leszczyński et al. (1992) giving fatteners 10 or 20% full-fat soya meal or tallow didn't termed statistically significant differences of the cholesterol level in longissimus dorsi. While Kouba and Mourot (1991) giving fatteners 4% corn oil from body weight 40 to 100kg have observed statistically significant influence increasing of the cholesterol level in muscles in comparison to fatteners receiving 4% tallow in feed rations.
Borowiec et al. (1998) giving fatteners dryied or steamed rapeseeds also have observed statistically significant influence increasing of the cholesterol level in ham muscles.
Chichłowska et al. (1995) and Barowicz and Pietras (1998) suggest that on the limitation of the cholesterol level in muscles and fat higher influence could have the relationship between polyunsaturated fatty acids n-6 to n-3 than general contain of essential fatty acids.
In own researches ratio of fatty acids n-6 to n-3 hesitated from 2,84 (standardised fat 20%) to 6,76 (soya oil).
Summing up the participation of soya oil in mashes for fatteners decreased the cholesterol level in blood plasma and ham and loin muscles.

Table 1. The cholesterol content of blood plasma and muscles of fatteners.

Feeding groups of fatteners	Blood plasma mg/dl			Loin *m. longissimus dorsi*	Ham *m. semimembra-nosus*
	Total cholesterol	HDL - cholesterol	LDL - cholesterol		
I - Control	95,99	40,88	46,71	54,17[a]	44,33
II - with soya oil supplement	85,94[a]	38,64	41,51[a]	40,80[b]	42,60
III - with 38,56% standarised fat supplement	99,01[b]	38,04	52,45[b]	49,80	39,40
IV - with 27,60% standarised fat supplement	85,55[a]	37,86	41,55[a]	51,50	43,50
SE	2,64	1,17	2,01	1,87	1,48
Significance different	X	Ns	x	X	ns

a, b - values in the same columns with different letters differ significantly (P<0.05).

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SOME ASPECTS OF INVOLVEMENT AND APPLICATION OF HORMONES, GROWTH FACTORS AND RELATED SUBSTANCES IN ANIMAL PRODUCTION

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Summary

His report represents brief review of original data of authors concerning involvement and application of hormones, growth factors and intracellular messengers of their action in the regulation of reproduction, growth and performance in farm animals. It was shown, that these substances are involved in the control of bovine, porcine, rabbitt, nutria and fowl's ovarian functions, as well as of porcine and nutria growth. Furthermore, it was shown, that these hormones can be used for the evaluation of biological activity of stimulators of bovine, porcine, rabbitt, nutria, human and fowl's reproduction, for characterisation and prediction of state of porcine and nutria puberty and reproduction, growth, plain of nutrition and meat production, for improvement of biotechnological methods (bovine, porcine and rabbitt cell transfection and embryo production), as well as for the direct control of reproduction and meat production rate in farm animals. Finally, our results suggest, that pharmacological regulators of intracellular mediators of hormones and growth factor action can be reliable, cheap and safe alternative to application of hormones in animal production and medicine.

Key words: hormones, growth factors, protein kinase, reproduction, puberty, growth, meat production

Introduction

Hormones, growth factors, growth factor binding proteins and intracellular messengers of their action play an important role in the control of various physiological processes and performance in farm animals. Nevertheless, their effects, mechanisms of action and areas of subsequent applications require further studies. This report represents brief review of original data of