

INFLUENCE OF LOCAL EXTRUDED SOYBEAN CAKE AND IMPORTED SOYBEAN MEAL ON FATTENING PIG PRODUCTIVITY AND PORK QUALITY



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INTRADUCTION Precision feeding is a major breakthrough in pig nutrition and it is one of the most promising avenues to promote high-quality and safe pork, high animal welfare, and minimal impact on the environment (Pomar & Remus, 2019). The aim of the study was to compare feed with imported soybean protein to feed with soybean protein grown and produced in Latvia, determine the impact of feed on the quality of carcasses and meat.

MATERIALS AND METHODS Yorkshire× Landrace cross breeds fattening pigs with start body weight 25 kg were selected for the trial. With the aim to carry out the studies two groups of pigs were formed 20 pigs in each group per pen balanced for body weight and sex. The bodyweight and feed intake were determined to evaluate average daily gain and average daily feed intake. The control diet included imported soybean meal, but in the trial group diets extruded soybean cake was made at the farm. Extruded soybean cake at farm was made from soya variety with early ripening ability (group 000) suitable for regions with lower (1500-1800°C) sum of effective temperatures, crude protein content 43.36%. In the trial were calculated and prepared three diets for each group similar in crude protein content and to be isoenergetic for metabolizable energy. The rations contained barley, wheat, canola or soybean oil, fish meal, salt and trace element vitamin premix, phytase, depending of pig liveweight and age. Feed samples were tested in the Scientific laboratory of Agronomic analysis of Latvia. To determine carcass and meat parameters the finisher pigs at the 110 kg liveweight were slaughtered in commercial slaughterhouse. Statistical analysis was performed according to the SAS/STAT 9.22 software package. Data were reported as arithmetic means with the pooled SEM. The results of investigation were compared using Student's t-test. Statistical significance was evaluated at P< 0.05.

RESULTS

Table 1. Influence of diets on feed consumption

Traits	Control group	Trial group
Feeding days	106	106
Feed consumption, (kg)	197.4	194.7
Feed consumption at day, (kg)	1.86	1.84
Feed conversion, (kg/d)	2.39	2.24

The pigs which fed soybean cakes grown in Latvia, showed by 3.3% higher live weight than pigs which fed mixed feed with imported soybean meal, there were no significant differences on pigs average daily gain.

Table 2. Comparison of standardized Ileal digestibility protein profiles in diets with ideal protein profiles InraPorc¹ Ideal protein profile.

Traits	Control group			Trial group			InraPorc ¹
	20–40	40–65	65–105	20–40	40–65	65–105	
Live weight, (kg)	20–40	40–65	65–105	20–40	40–65	65–105	20–140
Lysine	100.0	100.0	100.0	100.0	100.0	100.0	100
Threonine	63.1	65.9	67.9	63.3	64.1	65.6	65
Methionine	43.3	46.2	40.0	42.4	43.0	36.0	30
Methionine+							
Cysteine	75.8	81.4	83.8	73.1	74.7	74.1	60
Tryptophan	23.1	24.2	26.0	23.5	24.0	24.6	18
Valine	78.1	82.3	88.8	77.5	79.3	87.5	70
Isoleucine	68.1	71.3	75.9	65.7	43.0	72.9	55
Leucine	112.9	130.4	143.0	122.2	124.9	137.4	100
Histidine	41.8	43.8	48.4	41.5	42.3	46.3	32
Phenylalanine	85.4	90.3	103.5	85.2	87.2	98.6	50
Phenylalanine +							
Tyrosine	141.3	148.7	167.6	140.7	143.7	160.7	95
Tyrosine	55.9	58.3	64.1	55.5	56.5	62.1	–
Cysteine	32.5	35.3	43.8	30.7	31.7	38.2	–

InraPorc¹ Ideal protein profile (Milgen & Dourmad 2015)

Comparison of standardized Ileal digestibility protein profiles in diets with ideal protein profiles showed in trial group for feed (20–40 kg) Isoleucine was inadequate ratio it was insufficient. Milgen & Dourmad, (2015) concluded valine deficiency decreases feed intake to a great extent and consequently gain. The same observation can be made for isoleucine. The content of the other amino acids was higher than that reported by InraPorc ideal protein profile.

CONCLUSIONS

The results of the study showed that using of soybean cake grown and processed in Latvia can produce equivalent pig feed rations as using of imported soybean meal. Soybean grown in Latvia and processed in soybean cake can use in feed ration for pig during growing and fattening periods. The replacement of imported soybean protein by soybean protein grown in Latvia did not showed any negative impact on pig growth rates, quality of carcasses and meat traits. Economic evaluation is necessary to determine the effectiveness of soy produced in Latvia.

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Table 3. Influence of diet on pig carcass parameters

Traits	Control group	Trial group
Carcass weight, (kg)	78.5±6.09	82.1±6.47
Length of carcass, (cm)	103.2±3.63	104.3±4.89
Backfat, (mm)	11.0±3.0	9.6±2.5
Lean meat, (%)	61.60±0.80	62.00±0.72
Muscle-eye area, (cm ²)	62.40±10.05	68.20±14.93
Ham weight, (kg)	8.02±1.23	8.65±0.57

Table 4. Influence of diet on pig meat parameters

Traits	Control group	Trial group
Moisture, (%)	72.50	72.40
Protein, (%)	22.40	22.20
Fat, (%)	4.05	4.65
pH	6.01	5.59
Cholesterol, (%)	50.50	45.90
Tryptophan, (g 100g ⁻¹)	0.282	0.294
Hydroxyproline, (%)	0.11	0.12
Tryptophan : Hydroxyproline ratio	2.56	2.45

The obtained values carcass weight, length of carcass, muscle-eye area and ham weight showed better results at the trial group significant differences were not found between groups (P>0.05) Meat quality was not influenced by diets.

