GreenPork - impact of grass-protein to **slaughter pigs** on final meat quality

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Introduction

The market for organic pork is expanding, however the production is challenged by facts like increased ammonia emission and climate impact. So far, organic protein sources is based on imported soy, contrasting with the organic principles. Feeding organic pigs with bio-refined protein from grassland crops would lead to an organic pork production that are based on local feed, 100% organic and which is beneficial for carbon sequestration, biodiversity, weed management and resource efficiency.

The aim of this experiment was to study the effect of grass-protein as protein source for slaughter pigs on the meat and eating quality.

We present the results of increasing amounts of a grass-protein product (0, 5, 10, and 15%) in the diet to slaughter pigs from weaning to slaughter on slaughter quality traits, colour of meat and fat and eating quality.

Methods

The grass-based protein was refined from clover-grass with a content of 47% crude protein (CP) in the grass-protein product. Forty-eight D-LY sow pigs were included in the experiment from weaning (48 d old) and offered one of the four diets with 0, 5, 10 or 15 % grass-protein product. The diets were based on barley and wheat mixed with Chinese soy, peas and beans and the specific amount of grass-protein product (figure 1).
24 h post mortem the M. longissimus was sampled for meat quality analysis and part of the Loin (LD) was aged for 7 d and used for sensory profiling by a trained panel.

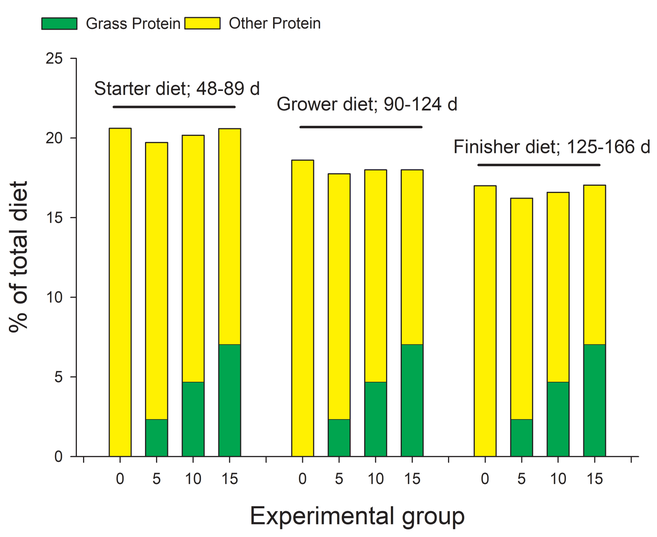

Figure 1: Amount of grass protein in starter, grower and finisher diet for slaughter pigs.

Results

Table 1: Slaughter and color characteristics of pigs fed with 0, 5, 10 or 15% grass-protein product

Diet, % grass-protein product	0	5	10	15	SEM	P-value
Carcass weight, kg	90.3	91.7	93.2	93.8	4.33	0.935
Meat percentage, %	57.2[b]	59.0[ab]	58.7[ab]	60.3[a]	0.71	0.025
pH	5.69	5.66	5.69	5.70	0.026	0.634
Colour, *M. longissimus lumborum*						
L*	54.6[a]	53.8[ab]	54.3[a]	52.7[b]	0.46	0.026
a*	8.72[a]	8.50[a]	7.46[b]	7.28[b]	0.35	0.001
b*	7.40[a]	7.17[a]	7.01[ab]	6.50[b]	0.21	0.024
Colour, fat						
L*	78.2[a]	76.6[b]	77.5[ab]	76.9[b]	0.37	0.017
a*	4.97	5.92	5.16	4.96	0.31	0.104
b*	6.42[c]	7.49[ab]	6.61[bc]	7.72[a]	0.36	0.030

[abc]LSMeans not sharing a common letter are significantly different (P<0.05)

Table 2: Sensory evaluation of pork loins from pigs fed 0, 5, 10 or 15% grass-protein product

Diet, % grass-protein product	0	5	10	15	SEM	P-value
Taste						
Acid	5.47	5.37	5.22	4.93	0.51	0.080
Sweet	3.99	4.10	3.95	4.06	0.48	0.877
Bitter	4.13	4.24	4.12	4.18	0.77	0.916
Flavour						
Roasted meat	7.66	7.47	7.44	7.20	0.30	0.142
Metallic	3.99	4.48	4.17	4.36	0.55	0.455
Piggy	3.47	3.69	3.57	4.03	0.69	0.082
Texture						
Juiciness	7.10	7.14	6.40	6.39	0.58	0.228
Tenderness	7.06	6.98	6.54	6.33	0.41	0.219
Fibrous	5.93[b]	5.93[b]	6.62[a]	6.74[a]	0.49	0.036
Chewing time	7.51	7.87	8.11	8.40	0.47	0.122

[ab]LSMeans not sharing a common letter are significantly different (P<0.05)

Conclusion

Pork raised on local produced bio-refined protein from clover-grass would be beneficial for the environment and the climate as well as the production fitting better with the organic principles. The study has shown the potential in this strategy as there where only minor differences in the eating quality of the loin depending on the amount of grass-protein in the diet.

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