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Influence of use of by-products from biofuel production in feeds for growing-finishing pigs

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Introduction:

By-products from the biofuel production are:
-Rapeseed-meal (RSM) and glycerine from biodiesel production
-Distillers dried grain solubles (DDGS) from bio-ethanol production
-Rapeseed-cake (RSC) in case of direct use of mechanically pressed rapeseed oil in engines.
The feed quality of rapeseed-meal is mostly equal and well documented in feed tables whereas rapeseed-cake differs in the content of ether extract and the feed value of DDGS is depending on the grain used (wheat, barley, rye, corn) and a lot of technical processes.

Material and methods:

In a trail with 100 growing-finishing pigs (50 females and 50 castrated males) from 35 kg live weight (LW) up to slaughtering (115 kg LW) the by-products RSM, DDGS from wheat and RSC have been tested in comparison to soybean-meal (SBM) in two feeding phases according to the following design:

Groups:	1	2	3	4	5
Feed:	SBM	RSM	DDGS	RSC	RSM/DDGS
Animals:	20	20	20	20	20
Slaughtered:	8	8	8	8	8

LW-range: ---------- 35 – 115 kg ----------

Feeding phases:

---------- 35 – 75 – 115 kg LW ----------

The content of the tested feedstuff varied from phase one to phase two between the following range:

SBM (%)	15/11	6/0	8/5	8/5	6/3
RSM (%)	0/0	10/15	0/0	0/0	5/6
DDGS(%)	0/0	0/0	8/10	0/0	5/6
RSC(%)	0/0	0/0	0/0	8/10	0/0

Results and discussion:

Table 1 shows the concentration of crude protein (CP), ether extract (EE) and crude fibre (CF) as well as lysine (Lys) of the tested feedstuffs. It is mentionable that the content of EE in RSM is higher then in the corresponding feed tables. Whereas all other crude nutrients are in the scale of the feed tables with a low value of lysine in DDGS.

Conclusion:

From the recent data it can be concluded that the tested by-products may be included into diets for growing-finishing pigs, also at high production level.

Table 1: Nutrients of the feedstuffs (in g/kg DM)

	SBM	RSM	DDGS	RSC
CP	476	374	369	325
EE	32	57	67	156
CF	90	140	75	159
Lys.	30	22	8	20

The most important feed characteristics of the mixed feed (mash form) are described in Table 2.

Table 2: Feed value of the mixed feeds (g/kg DM) in the first and second feeding phase

Group:	Phase:	1	2	3	4	5
CP	1	178	176	178	170	175
	2	163	166	166	164	169
EE	1	25	26	36	35	35
	2	32	32	34	45	38
CF	1	45	48	44	49	48
	2	42	46	41	47	42
ME (MJ)	1	14.6	14.5	14.5	14.7	14.5
	2	14.8	14.4	14.5	14.9	14.6
Lys.	1	10	11	11	11	11
	2	10	10	10	10	10

All pigs grew very fast with a mean daily weight gain (DWG) of 973g. In the first feeding phase group 5 had a significant lower DWG then group 1 ($p<0.05$; Figure 1). It can not explained, why the animals with the mix of RSM and DDGS grew slower then the groups with RSM and DDGS as the pure test feedstuff. Like the DWG in the whole trial, the feed intake (2.69kg to 2.83kg/day) and the energy conversion (36.7MJ to 38.3MJ/kg LWG) did not differ significantly ($p>0.05$). Also the slaughtering parameters showed no significant differences between the groups ($p>0.05$). Mean lean meat percentage (LMP) was between 54.4% and 55.7% and the mean backfat thickness between 25.1 cm and 29.0 cm ($p>0.05$).

Figure 1: DWG in the phases