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Faba beans to pigs-

Properties and possibilities of different cultivars

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Background

- Urgent need to decrease the dependence of imported protein sources in animal production within Europe.
- Faba beans- potential crop that can be used to a higher extent. Cultivation is increasing.
- CP ~30%, low methionine, contains ANS- tannins, vicine/convicine

Diapositiva 2

20441 Emma Ivarsson; 18/08/2016

Background

- White- and colour-flowered cultivars
- White-flowered cultivar- no or very low tannin content- recommended to monogastrics
- Variation between colour-flowered cultivars in tannin content
- Might some colour-flowered cultivars be possible to use in pig feeds?

Project plan

- Lab analyses of cultivar-specific samples

- Select a promising and an ’unpromising’ coloured cultivar, compare to a white-flowered cultivar and a soybean control

- Feeding trial weaner pigs

Materials and methods

- Extensive lab study
- 11 colour- and 5 white-flowered cultivars, 3 cultivation areas
- Analysed for DM, ash, CP, amino acids, condensed tannins (HPLC-FLP; procyanidin and prodelphinidins), and enzymatic digestibility *in vitro* (Boisen et al., 1991)

Major results lab study

	White-flowered	Colour-flowered
CP content % DM	31.0 (29-34)	31.1 (30-33)
Condensed tannins (CT) g/kg	0.16	6.32* (5.7-7.4)
Digestibility OM%	77 (74-78)*	70 (66-72)*
Digestibility CP%	98 (97-98)	93 (92-94)*

Selection of cultivars

- White-flowered:

  Gloria (% of DM)

  - CP: 34.4, dOM: 67.1 dCP: 33.6, CT: 0

- Colour-flowered:

  Julia (promising; % of DM)

  - CP: 32.6, dOM: 62.9; dCP: 30.6; CT: 5.7 g/kg

  Fuego (unpromising; % of DM)

  -CP: 30.4, dOM: 59; dCP:28.4; CT: 6.4 g/kg

Pig experiment- diets

- Control
- Gloria- 20%
- Julia- 10%
- Julia- 20%
- Fuego- 10%
- Fuego-20%

Optimized to be similar in energy (9.3 MJ NE), sidCP (12%), sid met (2.9 g/kg), sid lys (9.7 g/kg)

-cereals, soybean meal and potato protein substituted to the different cultivars of faba beans

Pig experiment-pigs

- 300 weaner pigs (Hampshire ×Yorkshire)
- 5 pens per treatment and 10 pigs/pen
- Split litter design with 5 batches of pigs
- 5-9 weeks of age
- Free access to pelleted diets in feed hoppers

Results

	Control	Gloria	Julia10	Julia20	Fuego10	Fuego20	SEM
BW 7 w kg/pig	15.8	16.3	16.2	16.1	15.8	15.8	0.80
BW 9 w kg/pig	25.1	25.8	26.4	26.5	25.6	25.2	0.57
ADG g/ pig and day	501	520	549	542	516	507	13.1
FI g/ pig and day	834	843	902	851	842	808	19.8
FCR (kg feed/ kg growth)	1.67^{b}	1.61^{ab}	1.65^{b}	**1.55^{a}**	1.63^{b}	1.61^{ab}	0.023

Discussion

- CT (5.7-7.4 g/kg) comparable to Jezierny et al. (2010) but lower then Makkar et al. (1997) 26.2 g/kg
- Lower digestibility in colour then white-flowered cultivars (Makkar et al., 1997; Jansman et al.,1993)
- Lower protein digestibility but maintained growth performance in growers fed diets with ~0.6 g/kg tannins (Flis et al., 1999)
- 25 % inclusion of colour-flowered faba beans, improved growth rate and decreased occurence of weaning diarrhea (Møller et al., 2014).

Conclusion

- 20 % inclusion of faba beans, independently of cultivar is possible in a weaner pig diets, when the diets are supplemented with synthetic amino acids.

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