

Peas and faba beans as home grown alternatives for soybean meal in fattening pigs



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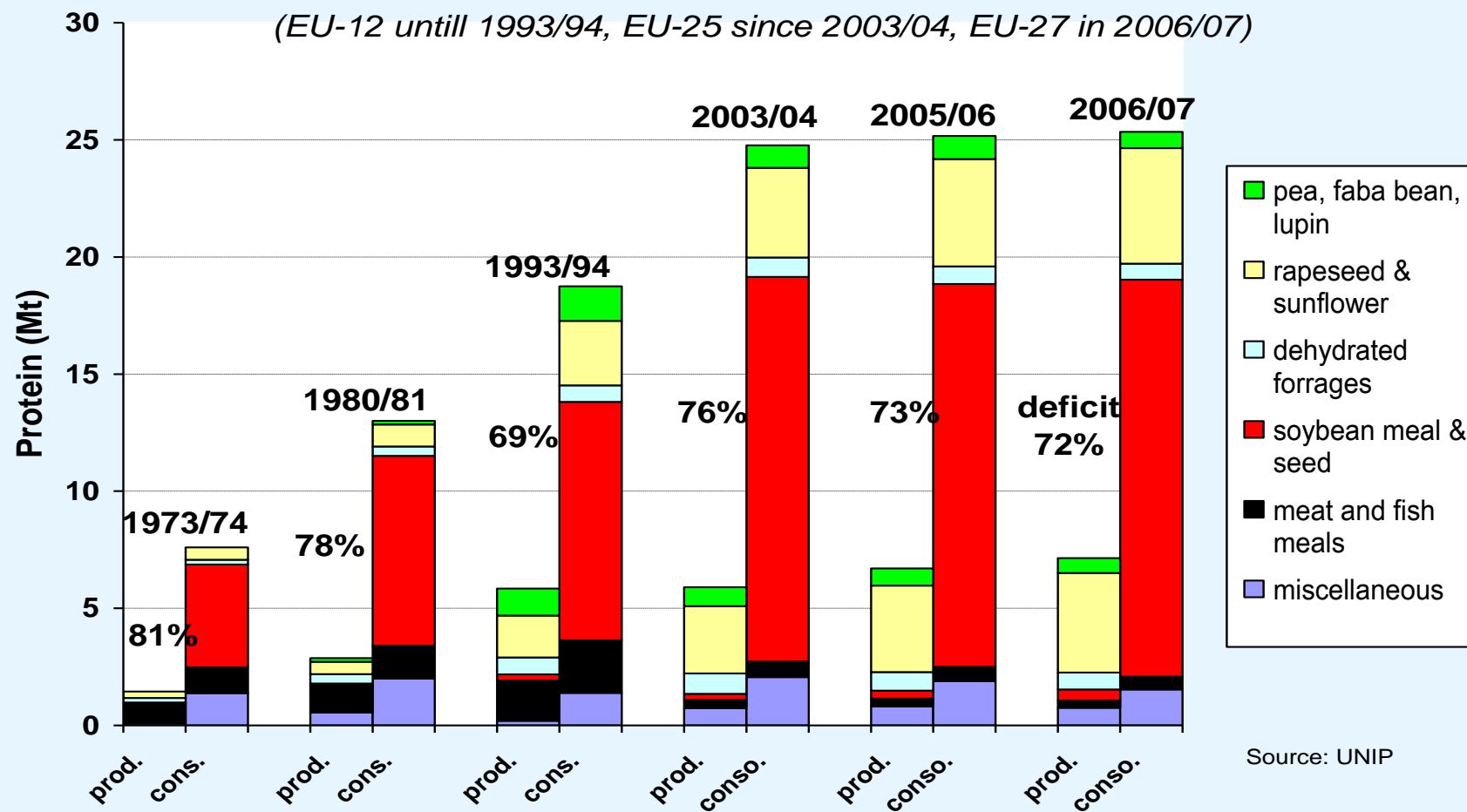


Protein use for animal feed in Europe



EU : Balance of Materials Rich in Protein in the EU

(EU-12 until 1993/94, EU-25 since 2003/04, EU-27 in 2006/07)



Source: UNIP

Food security

- The use of organic SBM has increased over recent years.
- Increasing concerns about the sustainability and security of UK pig production.
- There is a need to find a viable home grown protein source for pig diets.



Home-grown protein sources

- Peas and faba beans are a potential home-grown protein source.
- Associated with ↓ transport, ↑ food security and natural nitrogen-fixing abilities.
- Data on current dietary inclusion levels of peas and faba beans in UK pig feed are scarce.



Aim



To assess the effects of including different levels of selected pea and bean varieties in pig diets at the expense of soybean meal, on growth performance in grower and finisher pigs.

Treatments



- 9 Grower and finisher diets

Treatment No	Treatment	Inclusion level (g/kg)
1	Soybean meal control	-
2	Faba bean (var. Fuego)	75
3		150
4		225
5		300
6	Peas (var. Prophet)	75
7		150
8		225
9		300

Treatments



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• Diets are formulated to be iso-energetic and with the same SID lysine content		
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Small scale trial is the **first step** in determining the suitability of peas and faba beans for use in both conventional and organic pig production

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Experimental Design



- Groups of 4 Grower and Finisher terminal line Large White X Landrace pigs.
- 1 group of pigs per replicate, 4 replicates of each diet
- Measurements
 - Weekly Live weight
 - Weekly pen feed intake
- Performance measures
 - Body weight gain (BWG, g/pig/day)
 - Average daily feed intake (ADFI, g/pig/day)
 - Food conversion ratio (FCR, ADFI/BWG)



Grower Performance Data



Inclusion (g/kg)	BWG (g/pig/day)	ADFI (g/pig/day)	FCR	
SBM	-	823	1857	2.25
Faba bean	75	852	1979	2.34
	150	858	2000	2.34
	225	898	2069	2.30
	300	907	2013	2.24
Pea	75	898	1975	2.20
	150	836	1829	2.25
	225	918	2030	2.26
	300	834	1922	2.34
Control vs Pulse		0.24	0.18	0.51
Beans vs Peas		0.81	0.20	0.23
Linear effect		0.24	0.19	0.47
Quadratic effect		0.47	0.40	0.72

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No significant effect of pulse inclusion on Grower BWG, ADFI or FCR

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Linear effect	0.24	0.19	0.47
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Finisher Performance Data



Inclusion (g/kg)	BWG (g/pig/day)	ADFI (g/pig/day)	FCR	
SBM	-	1083	2699	2.51
Faba bean	75	1024	2528	2.55
	150	1011	2675	2.68
	225	980	2588	2.59
	300	1032	2633	2.57
	Pea	75	975	2482
	150	936	2463	2.59
	225	967	2576	2.65
	300	1003	2580	2.63
Control vs Pulse	0.04	0.13	0.19	
Beans vs Peas	0.15	0.16	0.97	
Linear effect	0.15	0.63	0.09	
Quadratic effect	0.03	0.12	0.27	

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Beans vs	• Pulse inclusion <i>per se</i> reduced finisher BWG by 8.5%		0.17	
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Beans vs Peas	<ul style="list-style-type: none"> • Pulse inclusion <i>per se</i> reduced finisher BWG by 8.5% • No significant reduction in ADFI • No significant increase in FCR 			
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Cont • **BWG tended to ↓ over initial inclusion levels and then ↑ over further**
 Bear **and final inclusion levels.**

Lineal • **No significant reduction in ADFI**
 • **No significant increase in FCR**

Quadratic effect 0.03 0.12 0.27

Summary



- No significant effects of pulse inclusion on grower BWG, ADFI and FCR.
- SBM control diets resulted in greater finisher BWG relative to the pulse inclusion diets *per se*, and a biologically unclear quadratic relationship for pulse inclusion level on BWG.
- No effect of pulse inclusion on Finisher ADFI and FCR.

Conclusions



- Data suggests in a conventional system, that feeding pigs pea or faba beans are a viable home-grown alternative to SBM in pig diets.
- In organic systems:
 - pea or faba bean rations could be balanced through greater use of methionine-rich ingredients e.g. prairie meal and potato protein.
 - Some degree of methionine deficiency may be tolerated due to pig genotype.
 - Free-ranging pigs *may* self-supplement protein from the range.

Conclusions – cont.

- Peas and faba beans have the potential to replace SBM in organic pig rations.
- Organic farm demonstration trials currently ongoing.



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 - Terry McHale
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 - Ian Nevison (BioSS)





SAC

 **Success through Knowledge**