



Australian Export Grains Innovation Centre



Functional value of coarse grains in pig breeder diets

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**Distiller's dried grains with solubles*



Department of
Primary Industries and
Regional Development



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Fibre and gut health

Gut health is a basic prerequisite for good performance in breeding sows

Adequate functional fibre is a key aspect of maintain good gut health

Fibre plays many roles in the diets of sows:

- Physical stimulation of the gut mucosa to prevent problems like ulcers
- Provide water holding aspects
 - faecal moisture, constipation prevention
- Non-starch polysaccharides
 - have prebiotic properties
- Satiety
 - need to manage body condition, minimize stress
- Substrate for hindgut fermentation
 - produce lactogenic volatile fatty acids

Fibre contributions

Fibre comes in many forms and from many sources. Apart from the traditional fibre components like wheat bran, rice bran, soya hulls, lucerne, palm kernel meal etc. the coarse grains (barley, oats, rye) and legumes (lupins, peas, faba beans) can also make a useful contribution.



Fibre contributions (continued)

	CORN	WHEAT	WHEAT BRAN	BARLEY	OATS	RYE	LUPINS	PEAS	FABA BEANS
DE _{SOW} MJ/kg	14.8	14.1	10.3	13.2	11.7	13.5	15.6	14.4	14.1
NE _{SOW} MJ/kg	11.4	10.6	6.8	9.7	8.3	10.0	9.0	10.0	9.3
Crude Protein %	8.0	11.0	14.0	10.0	9.0	9.0	30.0	23.0	26.0
Crude Fibre %	2.2	2.2	9.2	4.6	12.2	1.9	14.9	5.2	7.5
NDF %	10.4	12.4	39.6	18.7	32.8	14.1	22.3	12.0	13.7
ADF %	2.6	3.1	11.9	5.5	14.9	3.1	17.7	6.0	9.1

Advantages of barley in breeder diets

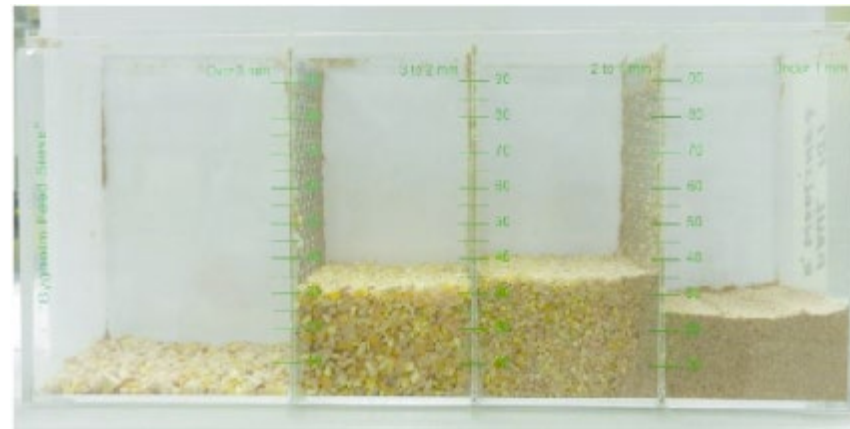
Relative to corn or wheat, barley offers the following advantages:

- Lower energy
 - This allows better energy intake regulation in gestating sows to control body condition
 - This allows higher feed intakes and hence better satiety to reach the same energy intake
- Lower starch / Slower fermentation
 - This reduces the risk of gastrointestinal accidents (bloating, bowel tympany, clostridial enterotoxaemia, prolapses)
- Higher fibre
 - This promotes gut health and lactation, while reducing the risk of constipation and the need to supply fibre from other sources
- Protein level and quality
 - Reduces the need for supplementary protein e.g. soybeanmeal



Grind size for sows

- Choosing the optimal grind size in sow diets
 - balance between good digestibility & gut health
- Corn – vitreous endosperm
 - Requires finer grinding for optimal digestion
 - 600-800microns
 - Increase risk to gut health
- Barley – Soft endosperm
 - No need for finer grinding in sow diets
 - 1200-1500 microns
 - Supports gut health



Milling methods

	HAMMER MILL	ROLLER MILL	DISC MILL
Particle size variation	Wide	Narrow	Intermediate
Power requirement	High	Low	Low
Adjustments	Limited (screen size / throughput)	Discipline required (gap, alignment, wear)	Automatic (computer preset)

Alternative = NO GRIND

- This involves simply mixing the complete diet formula, leaving the grain component whole and then passing this directly through the pellet press. The shear forces of the pellet die then shred the grain to create a muesli like texture

No grind pellets



Sow death



Constipation



Prolapse



High milk output sow

Milk Production:

- Average = 20.5 kg/d
- Peak = 28 kg/d

Litter:

- Born alive = 12 piglets
- Ave Birth Wt = 2.16 kg
- Ave Weaning Wt = 12.8 kg at 25 d



Conclusions

- Sow productivity is a prime driver of profitability in pig production
 - Gut health is an essential prerequisite
- The use of coarse grains such as barley in sow diets, helps realise the objective due to their many functional properties
- Sows perform best when fed a coarse mash or “no grind” pellet
 - Barley is well suited for these feed forms



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