



Development of integrated livestock breeding and management strategies to improve animal health, product quality and performance in European organic and 'low input' milk, meat and egg production








Ethical Problems and Breeding Goals

Subproject 3: Pigs


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 Wageningen, March 15 2011

An Ethical Overview




RESPECT FOR	WELLBEING	AUTONOMY (choice)	JUSTICE (fairness)
Animals	Animal welfare	Behavioural choice	Intrinsic value (integrity)
Farmers	Satisfactory income and workplace	Managerial freedom (independence)	Fair trade rules
Consumers	Food quality and safety	Choice and democracy (public wishes)	Affordability
Environment	Conservation	Biodiversity	Sustainability



Mepham & Millar (2001)

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Ethical conflicts




- › Animal welfare v farmer income & affordable food
- › Animal welfare v management choices
- › Animal integrity v product quality
- › Environmental impact v „naturalness“
- › Animal integrity v technological advance

Breeding?

	W	A	J
A			
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Income v welfare (1)

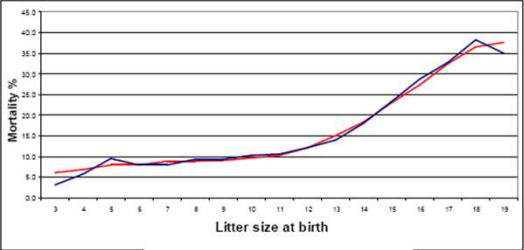


- › Breeding for prolificacy
 - › Piglet survival

Breeding? ✓

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— Farrowing crates — Farrowing pens

Weber et al. (2007)

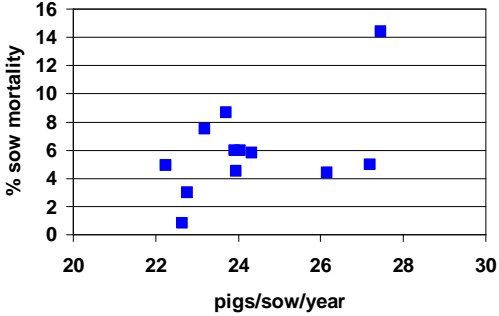
- › Neonatal survival of piglet ($h^2 = 0.04 - 0.2$)

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Income v welfare (1)




- › Breeding for prolificacy
 - › Sow longevity




Interpig (2009)

› Longevity of sow ($h^2 = 0.05 - 0.25$)




Breeding? ✓

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Income v welfare (2)




- › Breeding for lean tissue growth rate
 - › Fast and efficient growth, lean carcass
 - › ? Reduction in Robustness
 - › ? Ability to adapt to low input conditions




Breeding? ✓

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Income v welfare (2)




- › **Breeding for lean tissue growth rate**
 - › Metabolic function (ability to function with low quality diets)
 - › Immunological function (natural ability to resist disease)
 - › Skeletal function (predisposition to OCD and leg weakness)


Breeding? ✓

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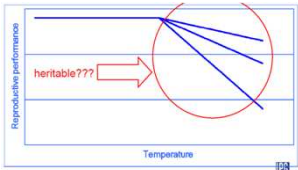
Income v welfare (2)



- › **Breeding for lean tissue growth rate**
 - › Thermoregulatory function (esp. in low input systems)
 - › Loss of fat insulation (piglets and pregnant sows)
 - › Loss of heat tolerance (finishing pigs and lactating sows)


Breeding? ✓




LIB project
Saskia Bloemhof

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„Naturalness“ v environmental impact



- › **Feed conversion efficiency**
 - › Low input systems use feed less efficiently so give greater environmental impact
 - › Traditional breeds - slower growth, greater fatness
 - › More natural environments – greater waste, climatic penalty




Breeding? ✓

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› **N.b. Correlates of breeding for efficiency**

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Management v welfare (1)



- › **Modified social organisation**
 - › Modified group size and composition
 - › Lack of group stability
- › **Breeding for reduced social problems?**
 - › Aggression in pigs ($h^2 = 0.2 - 0.4$)
 - › Tail biting in pigs ($h^2 = 0 - 0.3$)



Breeding? ✓

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Management v welfare (2)



- › Restriction of natural behaviour
 - › Early weaning age
 - › Barren housing conditions
- › Important Ethical issues but not solved by breeding



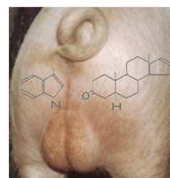
Breeding?

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Product quality v integrity



- › Castration
 - › Mutilation to reduce boar taint in meat
 - › Problem greater in low input systems
 - › traditional, early maturing breeds
 - › slower growth and imbalanced dietary protein



Breeding?

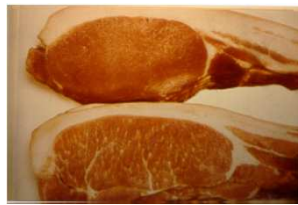
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- › Boar taint compounds ($h^2 = 0.25 - 0.75$)

Product quality v Genetic diversity



- › **Fat composition and human health**
 - › Fatter animals (traditional breeds) have more saturated fat
 - › Saturated fat increases human health risks
- › ? Can we breed for unsaturated fatty acids , esp omega-3



Breeding? ✓

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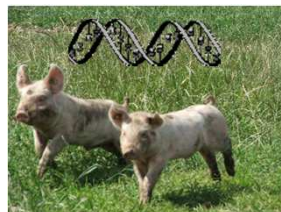


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Technology v integrity



- › **Genomic selection**
 - › Use of genetic markers, SNP information
 - › Not biological (phenotypic) information as used in traditional selection
- › **GM animals**
 - › Possibility of enhanced traits for low input systems



Breeding? ✓

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