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# Management and structures for cost reduction in pig farming

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Ludovic Brossard. Management and structures for cost reduction in pig farming. 52èmes Rassegna Suinicola Internazionale : Internationale conference "Cost reduction in pig breeding", Apr 2013, Reggio Emilia, Italy. 50 diapositives. hal-01210426

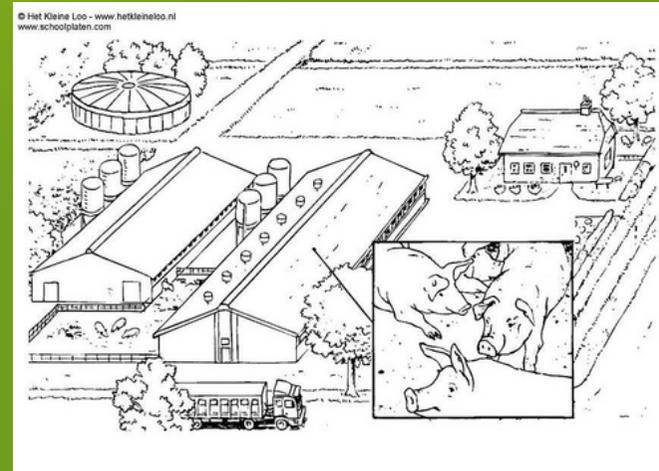
**HAL Id: hal-01210426**

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Submitted on 6 Jun 2020

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# Management and structures for cost reduction in pig farming

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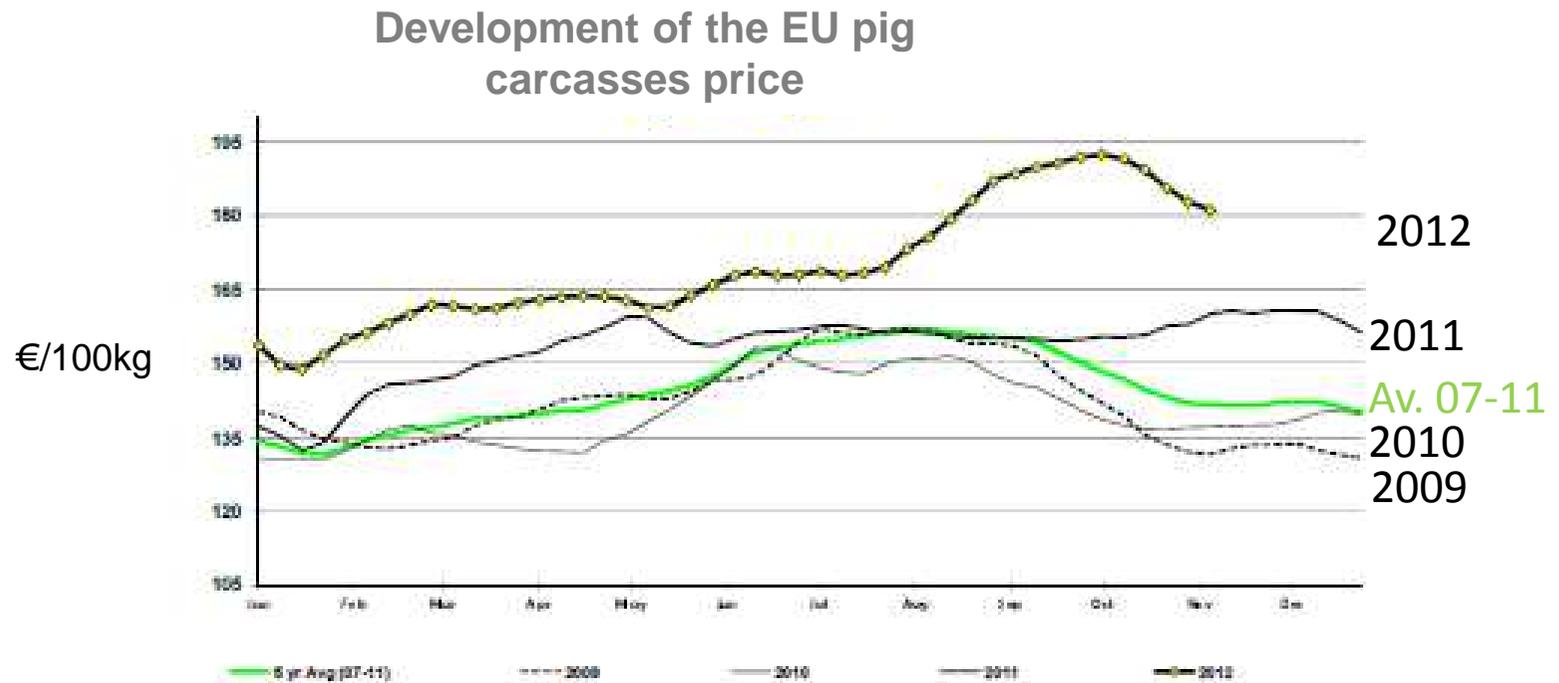


# INTRODUCTION (1)



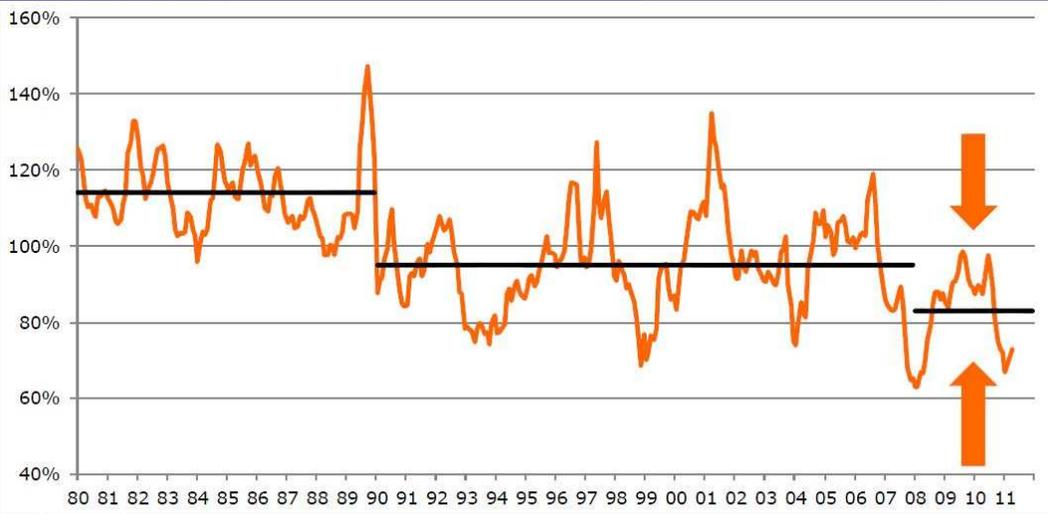
- ❖ **Competitiveness and economic sustainability of pig farms are linked to their capacity to:**
  - stabilize/ increase incomes
  - decrease costs
  
- ❖ **Farmers are challenged by the evolution of**
  - some types of costs (e.g., energy, feedstuff)
  - legislation (e.g., gestating sows in group)

# Recent evolution of feedstuff and pig prices in EU



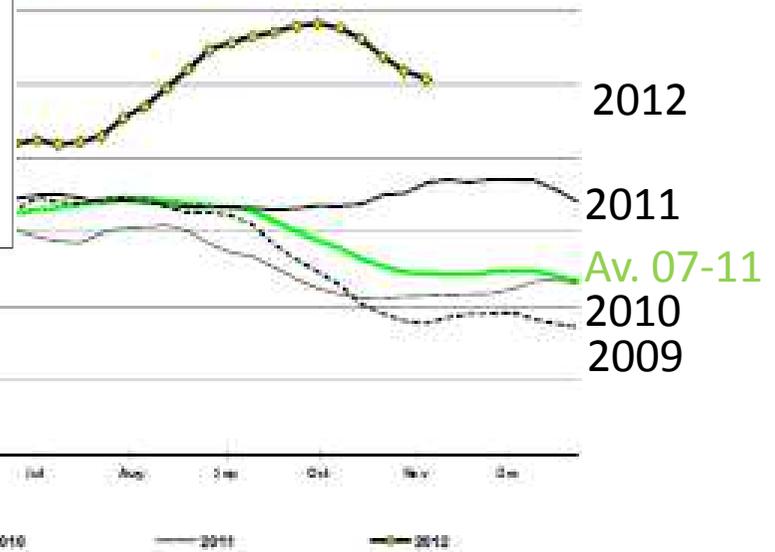
# Recent evolution of feedstuff and pig prices in EU

Index ratio EU hog price – feed costs (average 1980-2010=100%)



Source: European Commission, 2011

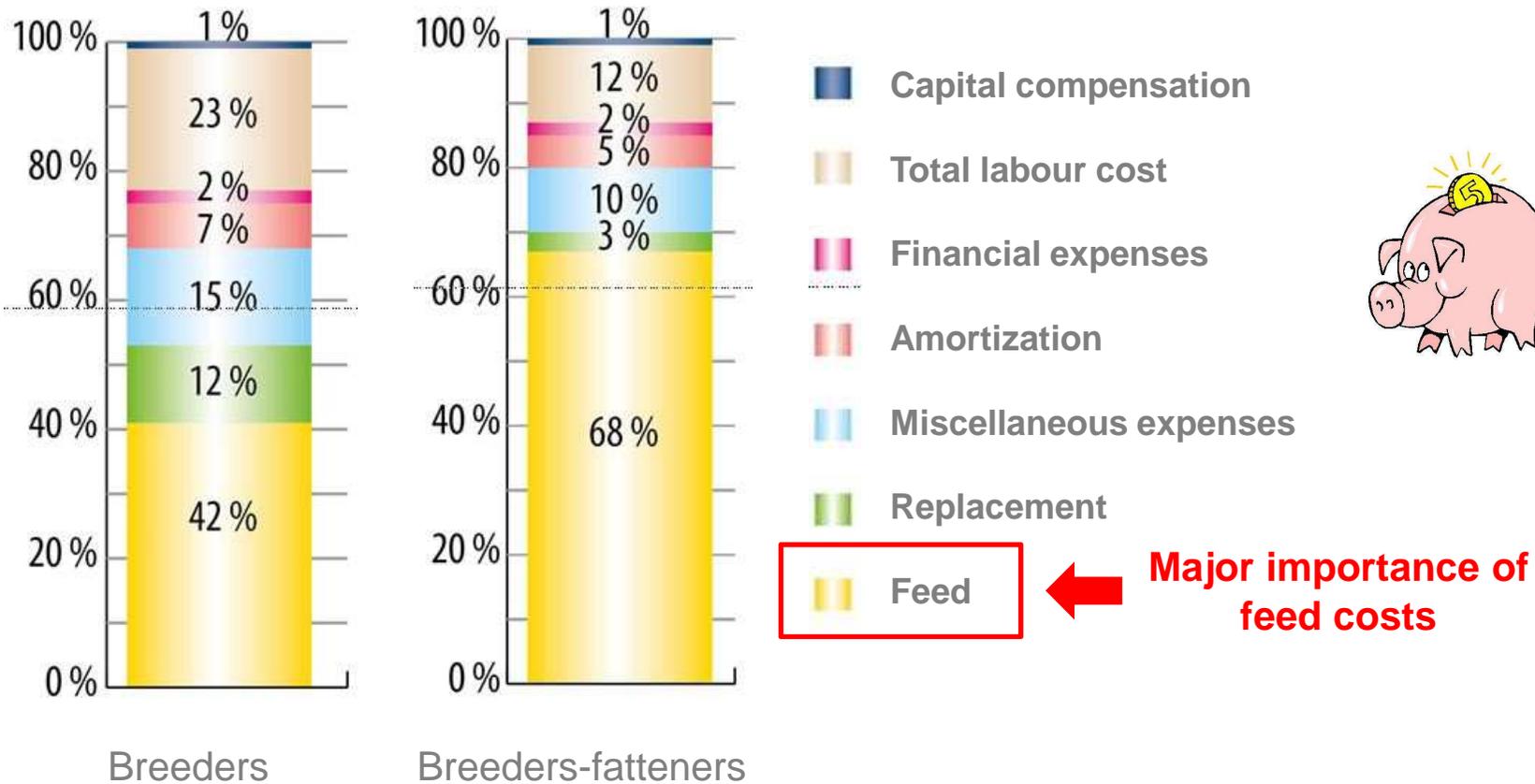
EU pig



## INTRODUCTION (2)

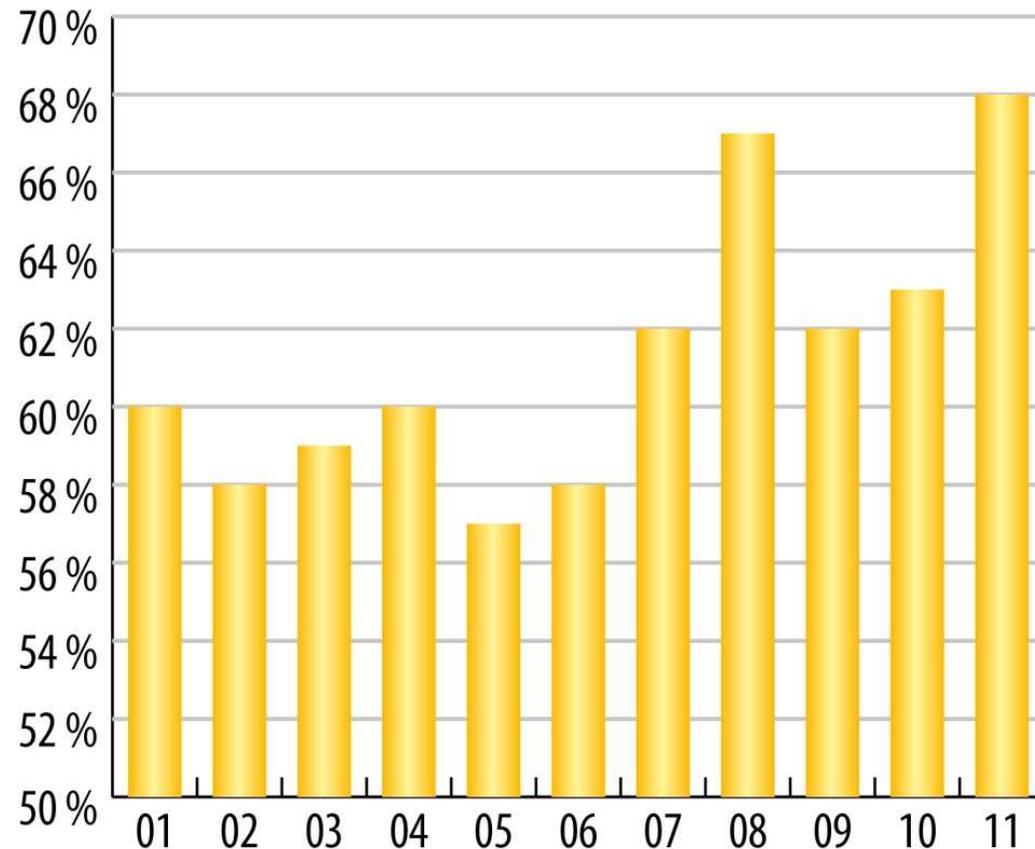
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- ❖ **Farmers are challenged by the evolution of**
  - some types of costs (e.g., energy, feedstuff)
  - legislation (e.g., gestating sows in group)
- ❖ **To reduce cost in this context, farmers have to optimize the use of their production tool in terms of management and structure**

# COST SOURCES IN PIG FARMING



Source : IFIP – GTE - TB

# EVOLUTION OF FEED COST PROPORTION IN TOTAL COST



Proportion of feed cost in total pig production cost increased to **68% in 2011**, a level higher than in 2008 and corresponding to a **surge in feedstuff prices**.

Source : IFIP – GTE - TB



# OUTLINES



- ❖ Reduction of feed costs in pig farming
- ❖ Other management and structural ways to reduce costs in pig farming



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# REDUCTION OF FEED COSTS

# HOW TO REDUCE FEED COSTS ?

❖ Feed costs are resulting from feed price and feed consumption

→ reduction of feed costs can be obtained by

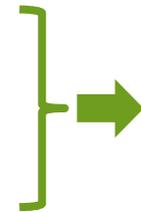
- decreasing feed price
- decreasing feed use or increasing feed efficiency



# FEED FORMULATION AND FEED COSTS

❖ For a feed, results of least cost formulation depend on:

- choice of ingredients
- price of ingredients
- nutritional objectives



**Replacement of expensive ingredients**



**Adjustment of objectives**

❖ For a feed sequence, cost depends on feed number and characteristics

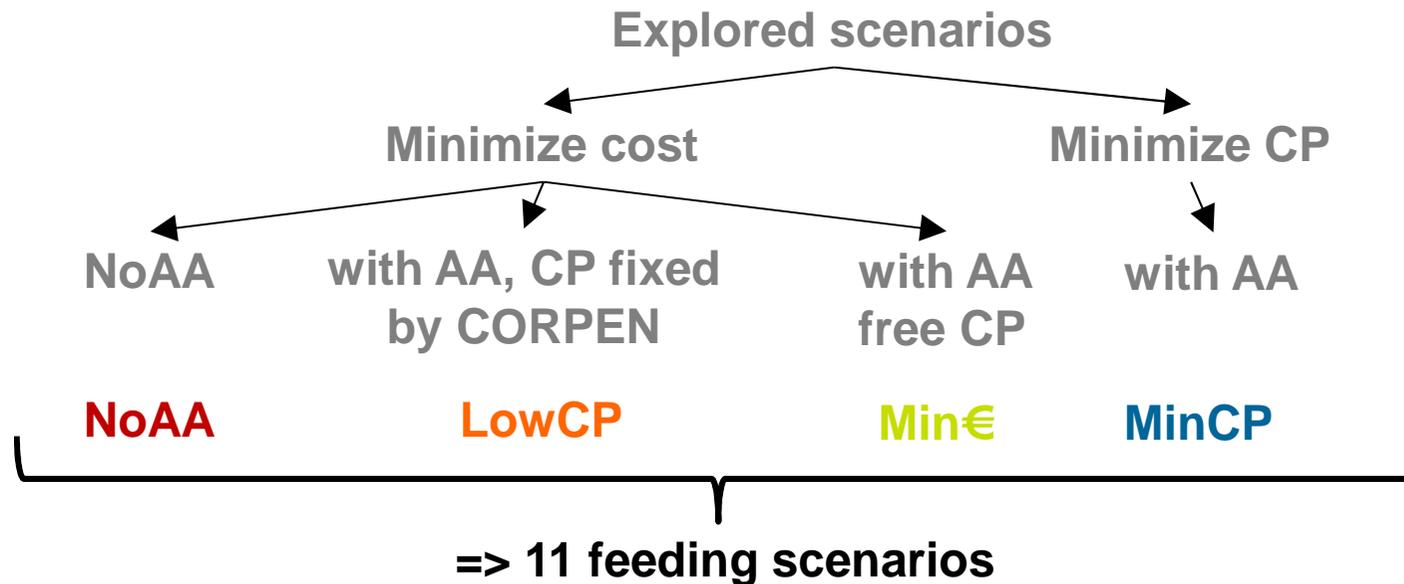


## Example of a simulation study on amino-acid incorporation and choice of protein source in formulation

Garcia-Launay et al., 2013

# SYSTEMS AND SCENARIOS

- ❖ Breeder – fattener farm (typical Britain farm)
- ❖ Sows and weaned piglets: 2 feeds per stage
- ❖ Fattening : One feed (1P) vs. Two feeds (2P) vs. Multiphase feeding (MP)



Garcia-Launay et al., 2013

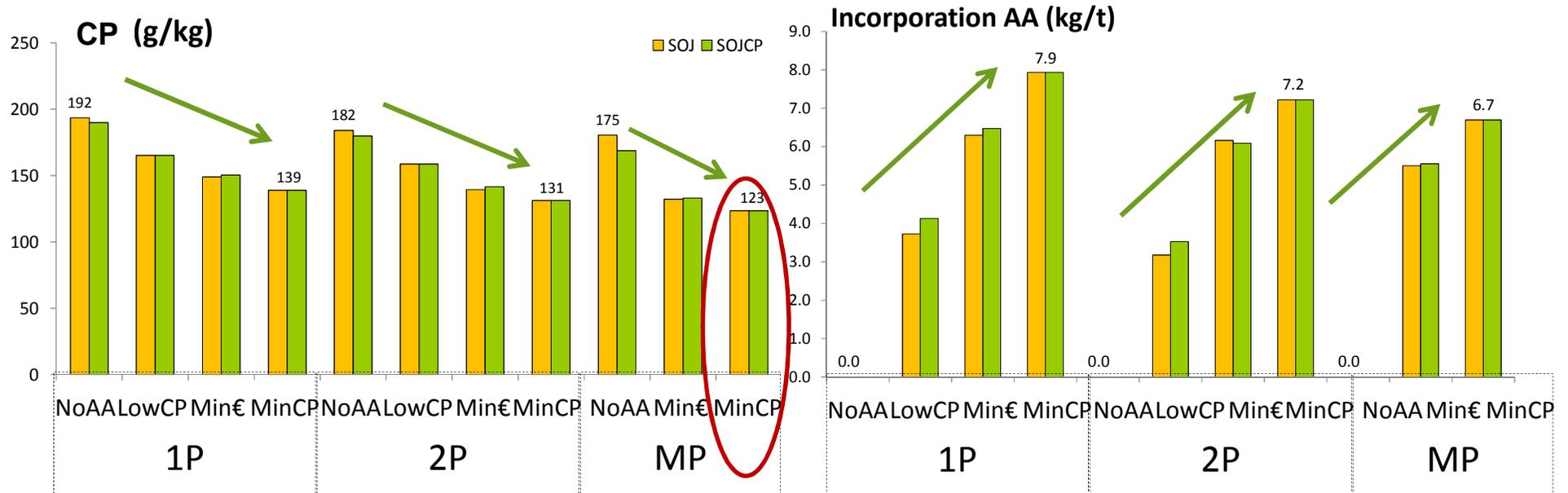


# FEEDS FORMULATION

- ❖ Two hypothesis / proteins:
  - soybean (SOJ) or soybean-rapeseed-peas (SOJCP)
- ❖ Respect of incorporation minima for digestible amino-acids  
(requirement profiles)
- ❖ No variation in net energy content in feeds
- ❖ **Formulation supposed to be at constant performances**
- ❖ Optimization of formula with Excel

Garcia-Launay et al., 2013

# FEEDS COMPOSITION AND COSTS (1)

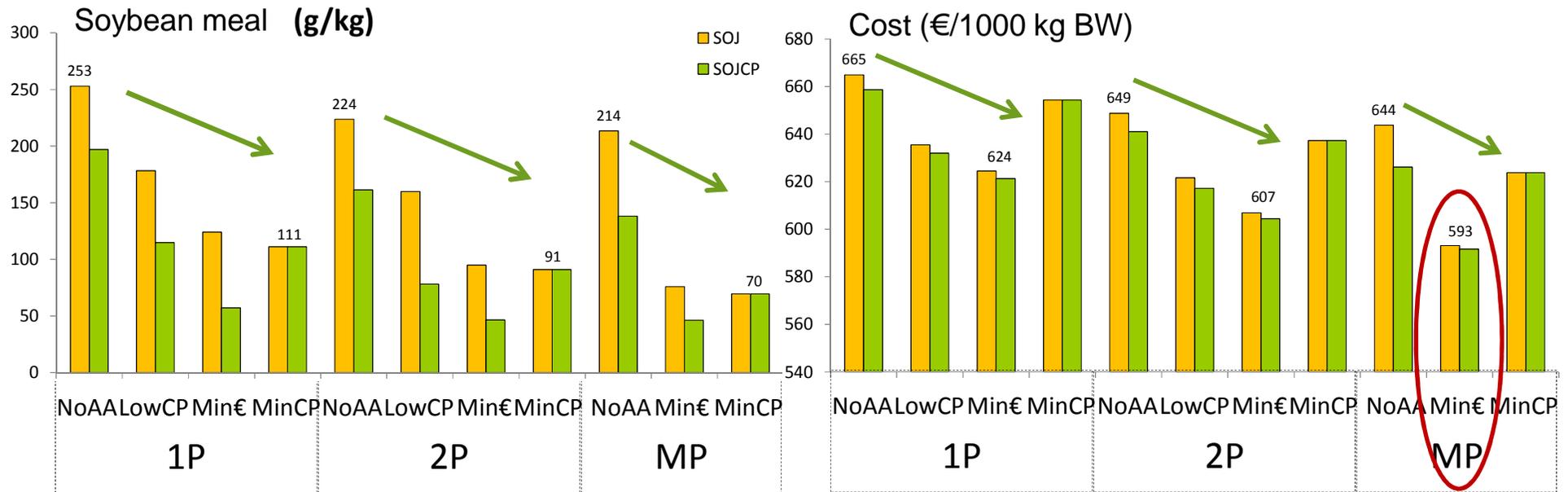


→ Incorporation of AA allows reducing CP content in feeds

→ Minimum CP in multiphase-MinCP

Garcia-Launay et al., 2013

# FEEDS COMPOSITION AND COSTS (2)



→ LowCP and Min€ : soybean meal is replaced by cereals and AA

→ Maximal cost without AA and minimal cost in Min€

→ Minimal soybean incorporation and cost in MP-Min€

Garcia-Launay et al., 2013



# FEED FORMULATION AND FEED COSTS

- ❖ Feed formulation can be adapted to decrease feed cost
  - alternative to soybean
  - decrease of CP content with AA incorporation
  - increasing number of phases to further reduce CP content and cost
- ❖ To be modulated depending on
  - ❖ context of price
  - ❖ possibilities of farm (feeding system)

# IMPROVEMENT OF FEED EFFICIENCY

- ❖ Feed efficiency = efficiency to transform feed in weight gain
- ❖ This efficiency can be modulated through
  - animal characteristics (genetic, sex...)
  - breeding management





# SEXUAL TYPE AND FEED EFFICIENCY

- ❖ Depending on countries, entire or castrated males are used in pig production
- ❖ The question of entire males breeding raises with the evolution towards a voluntary abandonment of surgical castration of piglets by 2018
- ❖ Nutrition and performance of the different sexual types are reevaluated



## Example of an experimental comparison of performance of boars, barrows and gilts

Quiniou et al., 2010

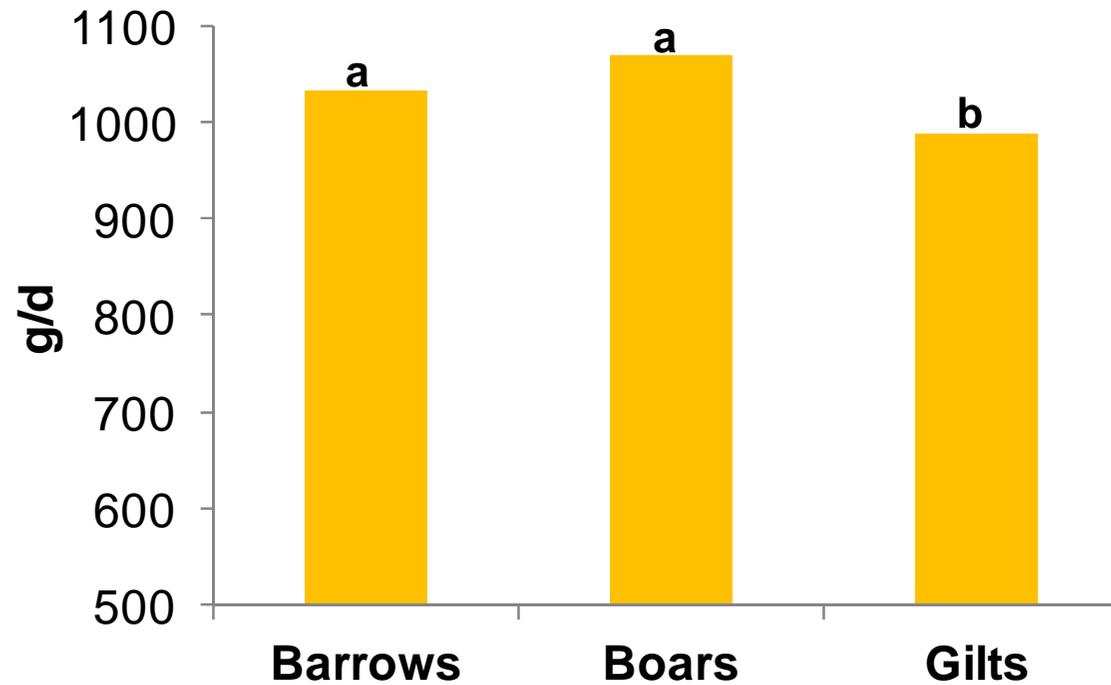


# EXPERIMENTAL DESIGN

- ❖ 90 pigs (Pietrain x Large White) x (Large White x Landrace)
- ❖ 30 boars, 30 barrows, 30 gilts (each type in 5 pens of 6 pigs)
- ❖ Followed from 63 days of age (25 kg) to 152 days of age (all slaughtered the same day)
- ❖ Fed ad libitum with a standard diet
- ❖ Individual weight, feed intake per pen

Quiniou et al., 2010

## RESULTS – AVERAGE DAILY GAIN

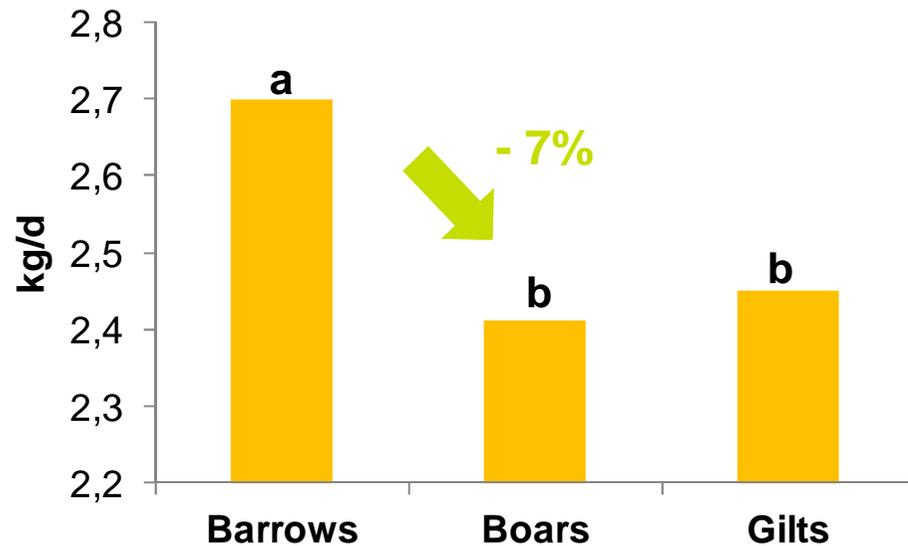


→ Lower ADG for gilts, no difference between barrows and boars

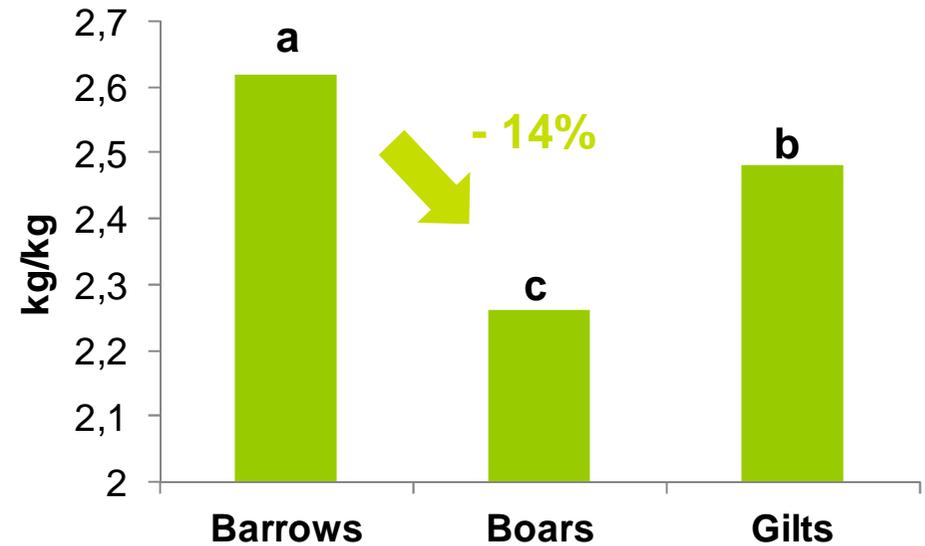
Quiniou et al., 2010

# RESULTS – FEED INTAKE AND EFFICIENCY

Feed intake



Feed intake / ADG



a, b, c:  $P < 0.05$

➔ Lower feed intake for gilts and boars, best efficiency for boars

Quiniou et al., 2010



# SEXUAL TYPE AND FEED EFFICIENCY

- ❖ **Breeding boars rather than barrows can improve feed efficiency and thus reduce feed costs**
- ❖ **To be balanced by**
  - possible negative interactions (adapted management)
  - boar taint problematic
- ❖ **Nutritional requirements to be determined**



# FEED ALLOWANCE AND EFFICIENCY

- ❖ Reduction of feed costs can be obtained by reduction of feed intake
- ❖ To be balanced by growth impact and carcass composition



## Example of a simulation study on effect of feed allowance on growth and economic performance

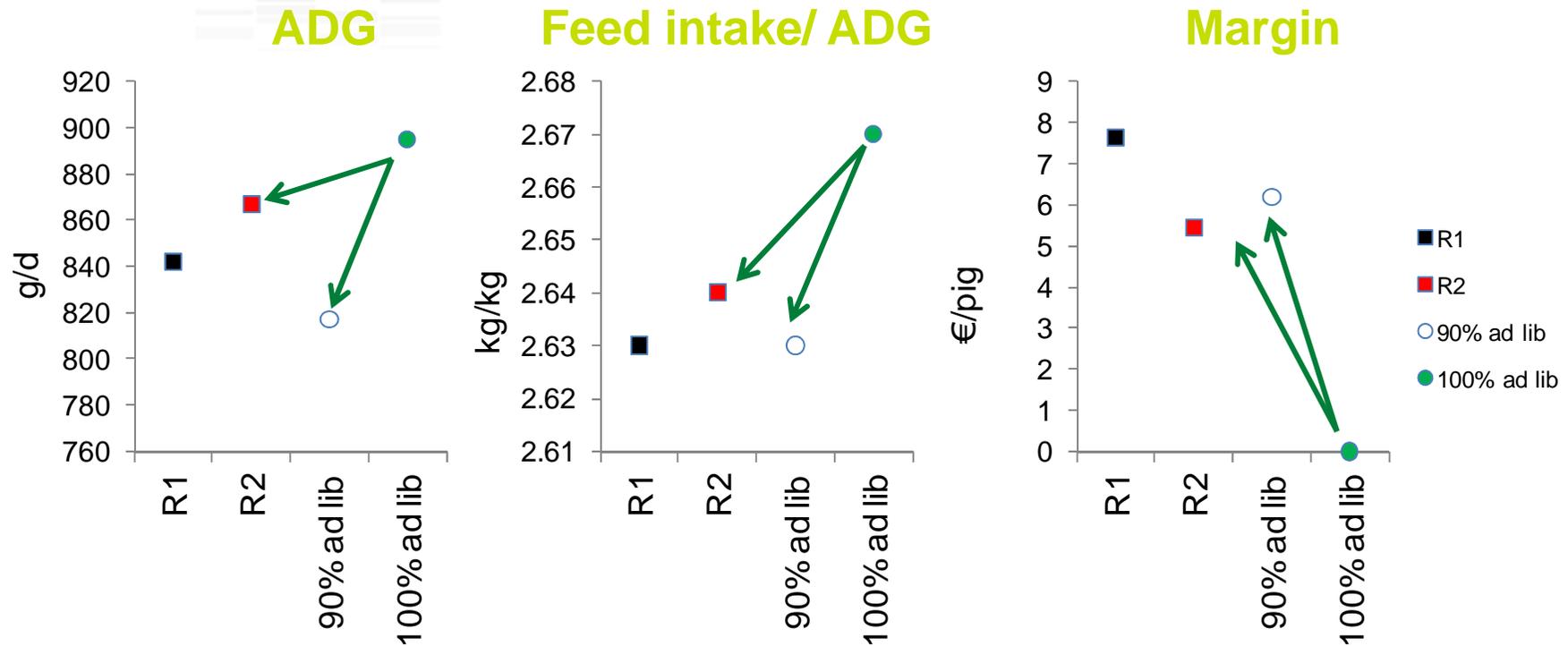
Quiniou et al., 2013

# EXPERIMENTAL DESIGN

- ❖ Simulation of 1000 barrows and 1000 gilts with InraPorc® software
- ❖ Between 70 days of age and a mean weight of 115 kg
- ❖ Comparison
  - ad libitum allowance
  - 90% ad libitum
  - ad libitum up to 2.4 kg/day for both barrows and gilts (R1)
  - ad libitum up to 2.7 kg/day for barrows and 2.4 kg/day for gilts (R2)
- ❖ Calculation:
  - Growth performance
  - margin (carcass payment – feed cost – work cost)



# RESULTS



→ Decreasing ADG with feed restriction

→ Increasing feed efficiency

→ Increasing margin (reduced feed cost and better paid carcass)



# FEED ALLOWANCE AND EFFICIENCY

- ❖ Reduction of feed costs can be obtained by reduction of feed intake
- ❖ To be balanced by growth impact and carcass composition
- ❖ To be balanced by welfare consideration and practical application

# TOWARDS PRECISION FEEDING

- ❖ Next step to improve feed efficiency, control feed costs while reducing environmental impact
- ❖ A way to deal with variability in batches



# AN EXAMPLE: GROUPED-HOUSED GESTATING SOWS

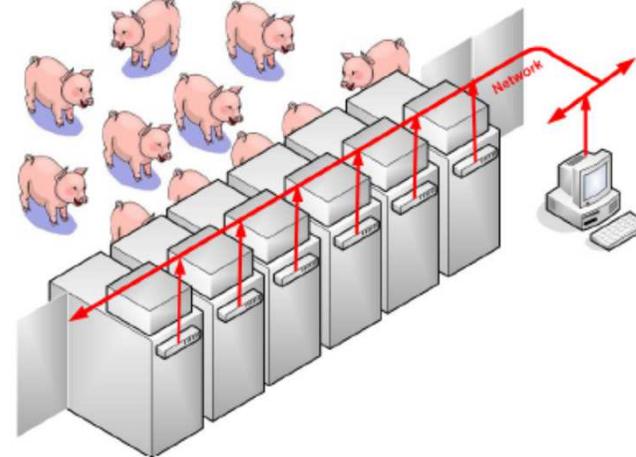
- ❖ Large groups of gestating sows
- ❖ Feeding stations with adapted feeding programs (ex.: primiparous, lean or normal sows; quantity, quality of feed) depending on backfat thickness
- ❖ Implies changes in management of feed and sows (monitoring...)



© dp

# PRECISION FEEDING PRINCIPLES FOR GROWING PIGS

- ❖ Monitoring feed intake and weight of individual pigs
- ❖ Providing the right amount of feed with the right composition at the right time to each pig in the herd
- ❖ Implies technical evolutions (formulation, feeding systems)





# PRECISION FEEDING POTENTIAL

❖ Example of Pomar et al. (2009)

❖ Comparison between

- a typical 3-phase feeding program (same diets for all pigs in a herd)
- Individually fed pigs with daily adaptation of diet per pig

(precision feeding)

❖ ↘ 5% of feed costs

❖ ↘ 25% and 29% of N and P intake, ↘ 38% of N and P excretion

# FEED COSTS – CONCLUSIONS

- ❖ Different ways to reduce feed costs depending on management choices
  - related to feeds (formulation...)
  - related to animals and efficiency of feed use (genetic, sex, allowance...)
- ❖ Evolution towards precise technical solutions
- ❖ Evaluation in terms of costs but also quality, environmental impact, welfare



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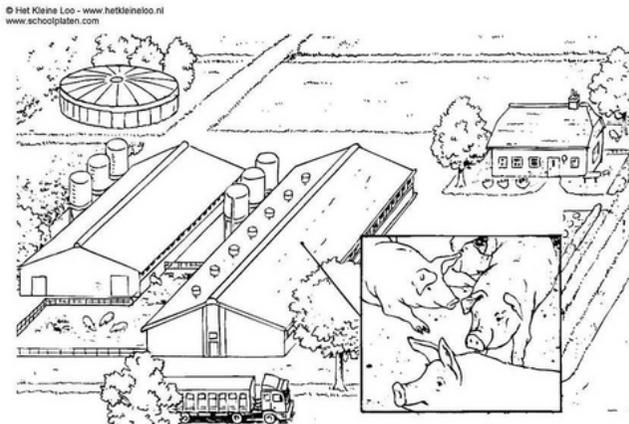
# OTHER STRUCTURAL AND MANAGEMENT WAYS TO REDUCE COSTS IN PIG FARMING

# MANAGEMENT AND STRUCTURE

- ❖ Management implies farmer practices



- ❖ Structure relies to technical choices (building, ...)





# MANAGEMENT IMPACT ON PERFORMANCE

- ❖ Survey on 1686 farms in France in 2010
- ❖ Sorting of farms on standardized margin:  
pig products – feed cost for sows and pigs
- ❖ Comparison of farms with low (20% of farms) vs. high (20% of farms) margin

Roguet et al., 2013

# MANAGEMENT IMPACT ON PERFORMANCE

Item	20% lower	20% higher
Nb of farms	337	337
Sows per farm	142	244

Roguet et al., 2013

# MANAGEMENT IMPACT ON PERFORMANCE

Item	20% lower	20% higher
Nb of farms	337	337
Sows per farm	142	244
Produced pigs / sow / year	19.5	25.3
Global intake index	3.11	2.76
Health cost / sow / year (€)	84.7	122.2

Roguet et al., 2013

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Health cost / sow / year (€)	84.7	122.2
Born alive piglets / litter	12.6	13.6
Weaned pigs /litter	10.6	11.9
Nb of litters / sow / year	2.41	2.51

Roguet et al., 2013

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Born alive piglets / litter	12.6	13.6
Weaned pigs /litter	10.6	11.9
Nb of litters / sow / year	2.41	2.51
Fertilization rate at 1 <sup>st</sup> service (%)	86	92

Roguet et al., 2013

# MANAGEMENT IMPACT ON PERFORMANCE

- ❖ Better results due to technicality in reproduction, close monitoring during farrowing, lactation and weaning ...
  - oestrus detection soon after weaning
  - specialized persons
  - close monitoring of farrowing
  - adoption of piglets
  - homogenization/sorting at different stages (farrowing, weaning, growing)
- ❖ Respect of biosecurity (quarantine, batch management...)

Roguet et al., 2013

# MANAGEMENT AND COSTS

- ❖ A better technicality improves farm performance
  - ❖ Potential higher structural costs are compensated by a higher efficiency of production tool and thus reduced production costs
- A great importance of the farmer profile, through technicality and willingness to improve performance**

Roguet et al., 2013

# STRUCTURAL COSTS (1)

## ❖ Labour cost

→ productivity can be improved by technicality or by modernization of production tool (automation, better layout of building for operating tasks)



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# STRUCTURAL COSTS – ENERGY (1)

## ❖ Farm structure have consequences on energy costs

- Age of building

before 1992 (1095 kWh) vs. after 1992 (890 kWh/sow/year)

- Type of feed distribution

dry feed (938 kWh) vs. soap (1111 kWh/sow/year for total farm)

- Type of soil: ex. Breeder fatteners

conventional (983 kWh) vs. straw-bedding (206 kWh/sow/year)

➔ Depending on technical choices and capacities to invest

ADEME, 2007

# STRUCTURAL COSTS – ENERGY (2)

## ❖ Reduction of energy costs

- Ex. : Heating / ventilation cost (85% of energy

costs)

→ good maintenance, positioning and setting

→ Farrowing unit with piglets nests



## ❖ Valorization / Production of energy on farm

- Heat exchange...
- Methane production, depending on farm capacity + effluents management



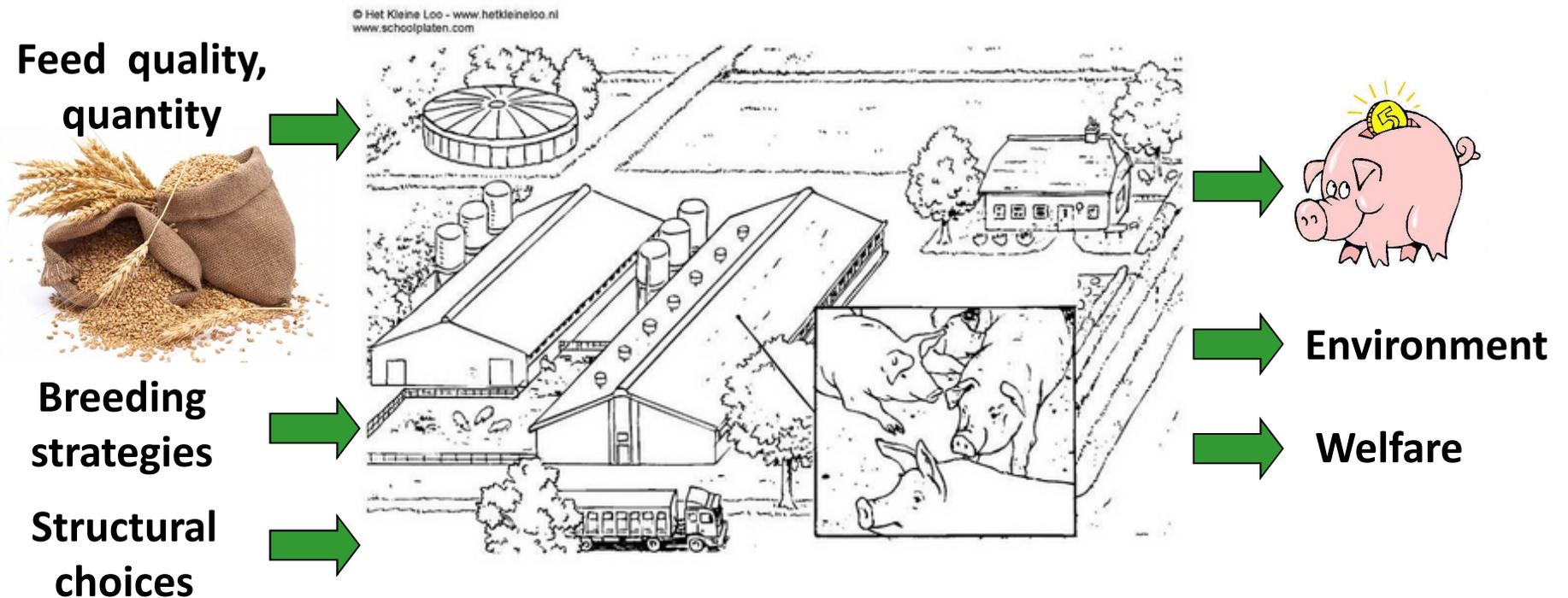
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# CONCLUSIONS

# MANAGEMENT AND STRUCTURE FOR COST REDUCTION

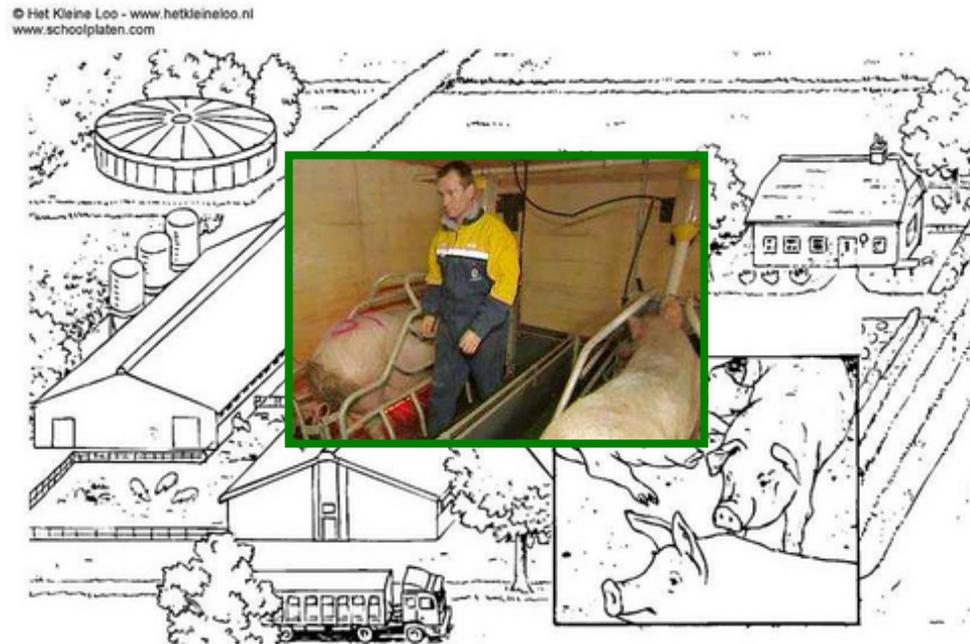
- ❖ Pig farming costs can be reduced by management and structure adaptation for improved efficiency of production tool



- ❖ A multicriteria evaluation is needed to evaluate interest of choices

# MANAGEMENT AND STRUCTURE FOR COST REDUCTION

- ❖ Farmer has a central role by its technicality and motivation



- ❖ The future is in a more technical, precise and monitored pig farming



**THANKS FOR YOUR  
ATTENTION**