IP Sustainable Pig Production

ECONOMIC ASPECTS

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Rennes, 2\textsuperscript{th} May 2011
Economic profitability

Social equity

Environmental health

SUSTAINABLE PRODUCTION
HOW CALCULATE THE PROFITABILITY OF PIG PRODUCTION?

- Which data do we need?
- How analyze their determinants?
Pig production is involved in the international competition and the producers need insights about advantages and disadvantages from different compared systems to have a competitive position.
PROFITABILITY DEPENDS ON

- **Structural factors**
  Technical-economic management and efficiency
  Knowledge of the farming systems

- **Conjonctural factors**
  Economic and/or sanitary crises
  To have an (anticipated) overview on Global Trade;
  Balance supply / demand
February 2010: (France):
Alive slaughter pigs:
1,12 €/kg liveweight
PLAN

- Part 1
  - International and European context of Pigs production and exchanges
- Part 2
  - Farming systems
- Part 3
  - Calculating the profitability of Pig Production
PART 1
INTERNATIONAL CONTEXT
WORLD MEAT PRODUCTION (2008)

PORK:

37.4% of the total meat
## PORK CONSUMPTION

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<td>85 127</td>
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<td>98 371</td>
<td>103 600</td>
<td>100 800</td>
<td>-2.7</td>
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* Estimations
(1) Ukraine, Croatia, Bosnia, Federal Republic of Yugoslavia

Source: Office of the Elevage d’après GIRA et FAO
## PORK CONSUMPTION/INHABITANT

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* Estimations

(1) Ukraine, Croatie, Bosnie, République Fédérale de Yougoslavie

Source : Office de l’Elevage d’après GIRA et FAO
PIG HERDS IN THE WORLD

Monde
772.5 millions de têtes

Chine 58 %

20 % UE à 27

Autres 4 %

9 % États-Unis + Canada

Japon + Corée du Sud

3 % Russie + Ukraine

4 % Brésil

Source : Les filières de l'élevage français, édition septembre 2009
WORLD PIG PRODUCTION (2008): 106 million tec
WORLD EXPORTS
WORLD IMPORTS

Source: Les filières de l'élevage français, édition septembre 2009
EUROPEAN CONTEXT
EUROPEAN MEAT PRODUCTION (2008)

UE à 27
42,6 millions de tccc

UE

Bœuf 19,3 %
Porc 50,4 %
Ovin-caprin 3,1 %
Volaille 27,2 %

Source : Les filières de l'élevage français, édition septembre 2009
EUROPEAN PORK CONSUMPTION (2008)
PORK CONSUMPTION/INHABITANT (EU 2008)

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<td>Irlande</td>
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Sources : SSP, Commission européenne, Douanes
EUROPEAN PIGS HERDS (2008)

Source: Les filières de l'élevage français, édition septembre 2009
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EUROPEAN EXPORTS AND IMPORTS
Source : Les filières de l'élevage français, édition septembre 2009
EUROPEAN EXPORTS (2008)

1.86 million of tec / 3.6 milliards d'euros

- Russie: 33%
- Japon: 15%
- Hong-Kong: 7%
- Corée du Sud: 6%
- États-Unis: 3%
- Australie: 3%
- Croatie: 3%
- Autres: 30%

Source: Les filières de l'élevage français, édition septembre 2009
EUROPEAN IMPORTS (2008)
PART 2
FARMING SYSTEMS
MODEL OF PIG PRODUCTION

different farming systems
SYSTEM 1 (CLOSED SYSTEM)

FROM THE INSEMINATION OF THE SOW TO THE DELIVERY OF THE PIG FOR SLAUGHTER: SS
Rem: can be divided according to the size of the herd
SYSTEM 2

FROM THE INSEMINATION OF THE SOW TO THE SALE OF PIGLETS AT WEANING: SW
SYSTEM 3: FROM THE BUYING OF PIGLETS AT WEANING TO THE DELIVERY OF THE PIG FOR SLAUGHTER: WS

Rem : Some systems can be specialised: « labelling production » (organic, certificated quality, ...)
PART 3
CALCULATING
THE PROFITABILITY
OF PIG PRODUCTION
DETERMINANTS OF PROFITABILITY

- I. Production efficiency
- II. Production cost
- III. Sale prices
I. PRODUCTION EFFICIENCY
Variables list of production efficiency
MANAGEMENT OF BREEDING HERDS

Average sizes
- Nb of present sows
- Nb of productive sows (1st insemination to slaughter)
- Nb of present boars

Litter results
- Piglets born alive per litter
- Piglets weaned per litter

Reproduction rhythm:
- Farrowing interval (days), Pregnancy length (d), Weaning age (d), Weaning to first service interval (d), Conception rate at first service (%)

Replacement:
- Annual replacement rate (%), Weaning to effective service interval (days)

Culling:
- Annual culling rate (%); age of sows at culling

Feed consumption / present animal
POST WEANING

- Weight at beginning
- Final weight
- Mortality
- Feed consumption/piglet/day (kg)
  - Daily liveweigh gain (from 8 to 30Kg) (g)
  - Feed conversion ration from 8 to 30
- Age at 30 kg (days)
FATTENING

- Weight at beginning
- Final weight
- Mortality
- Feed consumption / pig /day (kg)
  - Daily liveweight gain (from 30 to 115 Kg) (g)
  - Feed conversion ration from 30 to 115
- Age at 115 kg (days)
II. PRODUCTION COST
VARIABLES LIST OF PRODUCTION COSTS

- Feed cost
- Replacement cost
- Pigs purchases
- Miscellaneous expenses
- Rent
- External labour
- Investment depreciation
- Interest charge on financial debts
- Total labour
- (calculated) interest charge on ownership
COMPONENTS OF PRODUCTION COSTS ACCORDING TO THE FARMING SYSTEM

Own presentation from results of pig production in France (IFIP 2008)
III. SALE PRICES
SALE PRICES: ! VOLATILITY !

- Piglets at weaning (/pig)
- Piglets at 25kg (/kg)
- Alive slaughter pigs (kg liveweight)
- Slaughter pigs carcasses (/kg deadweight)
- Breeding animals (/animal)
- Culled sows or boared (/animal)
METHOD OF CALCULATION

By the InterPig model: concerns the whole pig production process

(RASMUSSEN, 2004; UDESEN, 2003)
CALCULATION OF THE OUTPUT

Piglet production

Nb of piglets born alive / sow / year

Lostes

Nb of piglets weaned / sow / year

Pig rearing

Lostes

Nb of piglets reared / sow / year

Pig fattening

Nb of fattening pigs sold / sow / year

Slaughter weight

Pork production

Pork production / sow / year.
Number of pigs entering fattening

= 

(NB OF LITTERS PER SOW X NB OF PIGLETS BORN ALIVE PER LITTER) 

- 

LOSSES DURING THE PERIODS OF WEANING
Number of finished pigs

= 

PIGLETS ANNUALY WEANED

- LOSSES (% MORTALITY) DURING WEANING AND FINISHING)
THE CARCASSE WEIGHT IS MEASURED AT THE COLD CARCASE (CANADA, FRANCE, IRELAND, ITALY, SWEDEN AND USA)

IF IT IS MEASURED AT THE WARM CARCASE (AUSTRIA, BELGIUM, GERMANY, BRAZIL, DENMARK, GREAT BRITAIN, THE NEDERLANDS AND SPAIN): THE MODEL APPLIES A COEFFICIENT TO ADJUST HOT WEIGHT TO COLD WEIGHT (-2%)
Figure 5: Number of piglets and production of pork annually 2006

Source: InterPIG 2007, own calculation.
Figure 6: Live weight at slaughter and killing out percentage 2006

Source: InterPIG 2007, own calculation.
CALCULATION OF THE PRODUCTION COSTS
# Calculation of the Feed (FC) and Labour (LC) Costs

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<thead>
<tr>
<th>FC or LC</th>
<th>Piglet production</th>
<th>Pig rearing</th>
<th>Pig fattening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per animal Feed and</td>
<td>Input of feed/sow X Price(s)</td>
<td>Input of feed/rearing pig X Price (r) Input of labour/rearing pig X wage/h</td>
<td>Input of feed/fattening pig X Price(f) Input of labour/fattening pig X wage/h</td>
</tr>
<tr>
<td>labour costs</td>
<td>Input of labour/sow X wage/h</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td>Feed costs and</td>
<td>LC</td>
<td>LC</td>
<td>LC</td>
</tr>
<tr>
<td>Labour costs per sold</td>
<td>FC/sow p.a</td>
<td>+ FC/rearing pig + FC/fattening pig</td>
<td></td>
</tr>
<tr>
<td>fattening pig</td>
<td></td>
<td>Sold fattening pig /sow p.a</td>
<td></td>
</tr>
</tbody>
</table>

- Feed and labour costs per kg Slaughter weight
- **Sum of the feed costs labour Slaughterweight/fattening pig**
Data we need

- Quantity of feed /animal
- Feed prices
- Quantity of hours/animal
- Wage rate

Other costs ...
Veterinary services
Energy
Water
Straw and bedding
Miscellaneous charges, taxes, ...
Transport
Building and equipments costs
Building and equipments maintenance
Interests (working capital, mortgage)
The calculation of the building cost is based on the capital required for establishing a new place for a sow, a rearing pig and finishing pig.

The annual costs are computed on the basis of a depreciation period of 20 years for buildings and 10 years for equipment.
Figure 4: International comparison of costs and revenues in pig production 2006

1) Without VAT.
2) Slaughter weight hot.
Source: Inter/Pig 2007; DMA 2006; own calculation.
Complementary information

Pig farming in the EU, a changing sector:


Exercises: See « Template of the data »