

Article

Life Cycle Assessment of Iberian traditional pig production system in Spain

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File S1. Questionnaire carried out on participating farms.

Date:

BLOCK A: GENERAL DATA

Name of farm: _____

Respondent Name

☐ Owner _____

☐ Manager _____

☐ Pig farmer _____

Farm address:

Coordinate points:

City/town:

Province:

Phone number:

Email:

BLOCK B: INVENTORY AND GENERAL MANAGEMENT OF THE FARM

0. USE OF FARM

Hectares of farm _____

Hectares property _____

Hectares rented _____ (€/ha) _____

Hectares dedicated to livestock _____

Hectares dedicated for agriculture _____

1. INVENTORY

1.1. How many **PIGS** were reared on the farm last year?

I.-Sows _____

III.- Gilts _____

II.-Boars _____

IV.- New boars _____

V.-Piglets _____

VI.-Rearing pigs _____

VII.- Fatteners pigs: Do you buy animals for fattening? _____ What type of fattening do you have?

Montanera? _____

Outdoors? _____

Intensive? _____

1.2. Which **BUILDINGS** can be found on the farm?

Type of building	Area (m ²)	Soil type (soil, cement, slat)	Value at beginning (€)	Age (years)	What kind of animals use the installation?

Number of campings, if you use them _____

Other aspects of pig installations:

a) Ventilation: ☐Natural ☐Forced ☐Mix

b) Cold ventilation in gestation: ☐Yes ☐No

c) What type of enrichment material do pigs have?

☐Straw ☐Balls ☐Rope ☐Logs ☐None

Other aspects of general installations:

a) Use electricity ☐Public ☐Auto-generator ☐Do not use

b) Use water: ☐Public ☐Own Well ☐River ☐Other _____

Service	Activity or place of use	Percentage	Activity or place of use	Percentage
<i>Electricity</i>				
<i>Water</i>				

c) Distance from the road to the home address (km): _____

- d) Type of access: ☐ Road in bad conditions
☐ Road in good conditions
☐ Asphalt

1.3 What **MACHINES** can be found on the farm?

Type of machine	Number	Value at beginning (€)	Age (years)

Note: car, tractor, trailer, seeder, seed drill, fertilizer, harrow, generator, pumps, mill, silo, feed chain, scale, ...

2. GENERAL MANAGEMENT ON THE FARM

2.1 REPRODUCTIVE MANAGEMENT

2.1.1 What type of mating is done on the farm?

- a) Artificial insemination b) Natural service c) Both

2.1.2 How many mating are performed per year? _____ Births? _____

2.1.3 Indicate periods that carry out mating

Mating	January	February	March	April	May	June
	July	August	September	October	November	December

2.1.4 If you use A.I. go to question 2.1.5.

How many pens per mating do you make? ____

How many females per pen? ____

How many males per pen? ____ How long is male with females? ____ days

2.1.5 Breed of boars: ☐ Iberian ☐ Duroc ☐ IberianXDuroc

2.1.6 Do you make ultrasound for gestation diagnosis? ☐ Yes ☐ No

2.1.7 How many sows calve of the total? ____

2.1.8 On average, how many piglets are born per sow? ____ How many piglets are born alive? ____

2.1.9 On average, how many piglets does weaning per female? ____ Weaning age? ____ days. Weight? ____ kg

2.1.10 Age gilt in the first mating ____ months

2.1.11 Average reproductive life sow ____ years

2.1.12 Do you make any strategy for induction oestrus? ☐ Yes ☐ No

If your answer is **YES**, what strategy and how do you do it?

	Indicate (time, kg supplementation/days)
<i>Male effect</i>	
<i>Flushing</i>	
<i>Hormone treatment</i>	
<i>Others</i>	

Do you supplement sows? ☐ Yes ☐ No

If your answer is **YES**, when and how do you supplement them?

	Kg/day	Nº days	€/kg
Before birth			
Post-birth			
Until weaning			

Do you provide mineral supplement (salt)? ☐ Yes (specify product and quantity: _____)

☐ No

2.1.13 Replacement and culling animals

a) Replacement strategy (gilts and new boars) (Rate 1 to 5 (1 is very important and 5 not at all important))

Selection criteria	Maternal character	Conformation	Prolificacy	Colour	Genetic
Value					

b) What is the origin of the new breeding animals on the farm? (Mark with **X**). What % of breeding animals are new breeding animals (gilts and new boars) each year?

	Own	Foreign	Average replacement (%)	Cost (€/animal)
Gilts/Sows				
Boars				

c) Culling animal strategy (sows and boars) in the last 12 months (Rate 1 to 5 (1 is very important and 5 not at all important))

Elimination criteria	Age	Lactation problems	Reproductive problems	Health problems	Other_____
Value					

2.2 FEEDING TABLE

Management table and feeding table

Stage	Stage duration	Weight		Food/animal					
		Start	Final	Concentrated feed		Grass	Acorn	Straw	Other (by-products)
	Days or months	Kg		Kg/day					
Dry sows									
Sows (mating)									
Sows (pregnant)									
Farrowing sows									
Boars without activity									
Boars (mating)									
Piglets									
Rearing pigs									
Growing pigs									
Fatteners (montanera)									
Fatteners (outdoors)									
Fatteners (intensive)									
Gilts									
New boars									

2.2.1 How much concentrate did you buy last year? _____ kg total

What is the origin of concentrated feed _____

2.2.2 Did you buy another type of food? (straw, silage,...) _____

How much? _____ Tn or kg _____

2.2.3 MONTANERA

a) Are your animals fattening in montanera? ☐ Yes ☐ No (If your answer is **NO**, you will go to question **2.2.4**)

b) Type of grazing:

- Rotational (various enclosures) ☐
- A single enclosure ☐
- Guided ☐
- Other ☐

c) Place of grazing:

- Natural pastures ☐
Cereal crop ☐
Legume crop ☐
Other ☐

d) Montanera dates

	START	FINAL
Data		

e) How old are pigs when they enter in montanera? _____ months

f) How many Hectares do you use for montanera? _____ hectares

g) What is the average density of oaks on the farm? (oaks/hectare) _____ ☐ N.A.

h) Acorn production? (kg/oak) _____ ☐ N.A.

2.2.4 FOOD MANAGEMENT

a) Do animals have access to water 24 hour a day? ☐ Yes ☐ No

b) Do animals have access to food 24 hour a day? ☐ Yes ☐ No

c) If you answer NO, how many times a day the animals have food? _____

d) Are diets proposed by professional nutricionist? ☐ Yes ☐ No

e) What is flow of water (litres/minute) of drinkers? _____ ☐ N.A:

f) How do you feed pregnant sows?

☐ In group

☐ Individually

☐ Other.....

g) Does food of the pregnant sows change according to their body condition? ☐ Yes ☐ No

h) Do you provide fibber to pregnant sows?

☐ With straw

☐ In diet

☐ N.A:

i) Do you have a system of pre-training for the feeding system (sows)?

☐ No

☐ Yes

2.3 OTHER ACTIVITIES IN THE FARM (AGRICULTURE AND LIVESTOCK)

2.3.1 Do you do other agricultural activities on the farm?

☐ Yes (continue)

☐ No (you will go to question **2.3.8**)

2.3.2 What other activities do you do on the farm?

☐ Cereal crop (wheat, etc). Hectares _____ yield (Ton/ha) _____

☐ Fodder production. Hectares _____ yield (Ton/ha) _____ trucks, sheds _____

☐ Other crop _____ hectares _____ yield (Ton/ha) _____

☐ Forestry area. Hectares _____

☐ Hunting

☐ Recreative (Rural house, guided tours,...)

2.3.3 Do you fertilize the agricultural area? ☐ Yes ☐ No

With what compost do you fertilize and how much per hectare?

☐ Synthetic _____

☐ Organic _____

☐ Other _____

Cost per year (fertilisers) _____ €

2.3.4 Use of agricultural product obtained in crops:

Animal consumption in your farm ☐ Yes (species: _____) ☐ No

Sale ☐ Yes (whom: _____) ☐ No

2.3.5 Transformation of agricultural product ☐ Yes (type product _____) ☐ No

2.3.6 Forage conservation: ☐ Hay ☐ Silage

2.3.7 Are grasses shared with other domestic species in rotation cycles? ☐ Yes ☐ No

What species? _____ How many hectares are shared? _____

2.3.8 Do you do other livestock activities on the farm? ☐ Yes (continue) ☐ No (you will go to question 2.3.10)

2.3.9 What other livestock activities do you do?

☐ **Cattle Inventory:** Cows: _____ Bulls: _____ Heifers: _____
N. animals sold _____ type? _____ Average price _____ €

☐ **Sheep Inventory:** Ewes: _____ Rams: _____ Lambs: _____
N. animals sold _____ type? _____ Average price _____ €

☐ **Another species** _____ **Inventory:** Females: _____ Males: _____
Nº animals sold _____ type? _____ Average price _____ €

2.3.10 What % of income comes from pig production over total income? _____%

2.3.11 What % of income comes from each activity? Agricultural _____%

Livestock _____%

2.4 HEALTHY ASPECTS

2.4.1 Health treatments

a) Health status: _____

b) What diseases are present throughout the year?

- c) Do you vaccinate against which diseases?
- d) Which vaccination program do you have on your farm?
- e) Are you deworming the pigs on your farm? ☐ Yes ☐ No
If your answer is **YES**, How often and method are you deworming? _____
- f) What other treatments do you usually use?
- ☐ vitamin-mineral complexes _____
- ☐ antibiotics _____
- ☐ analgesics _____
- ☐ other _____
- g) In the last three months, how many animals have received antibiotic treatment? _____
- h) Do you isolate sick animals in any way? ☐ Yes ☐ No
- i) Have staffs trained in selection and administration of veterinary medicines? ☐ Yes ☐ No
- j) Medication costs in the last year: _____

2.4.2 On-farm **mortality**

Deaths in last year

Stage	Nº dead animals	Main cause of death
Sows		
Boars		
Piglets		
Rearing pigs		
Growing pigs		
Fatteners (montanera)		
Fatteners (outdoors)		
Fatteners (intensive)		
Gilts		
New boars		

- a) What is the percentage of euthanasia? _____%
- b) How is euthanasia practiced in animals?
- ☐ Captive bolt pistol
- ☐ Drugs
- ☐ Other _____
- c) How many carcass have been rejected in the last 3 months? _____ ☐ NA
- d) Main reasons rejection:
1. _____
2. _____
3. _____

2.5 ANIMAL MANAGEMENT

2.5.1 Piglets

a) Are piglets mixed in pens after weaning? ☐ Yes ☐ No

If you do not make groups, what do you do with the piglets? _____

b) How many piglets do you group?

☐ < 30 piglets ☐ 30-50 piglets ☐ > 50 piglets

c) Do you establish groups of piglets by sex or by weight?

☐ by sex ☐ by weights ☐ not contemplated

d) How long do the piglets stay in these groups?

☐ < 1 month ☐ 1-3 months ☐ > 3 months

e) Are the piglets' tails cut routinely (intensive management)?

☐ No

☐ Yes. *In this case, can you explain why, when and how it is done?*

Why? _____

When? _____

How? _____

f) Are the piglets' teeth cut routinely (intensive management)?

☐ No

☐ Yes. *In this case, can you explain why, when and how it is done?*

Why? _____

When? _____

How? _____

g) Ringed

☐ No

☐ Yes. *In this case, can you explain why, when and how it is done?*

Why? _____

When? _____

How? _____

h) Do you apply any extra good practices to improve animal welfare?

☐ No

☐ Yes, please describe:

j) Are staff trained in animal care? ☐ Yes ☐ No

k) What do you use to move animals?

☐ Wood panel ☐ Electric prod ☐ Dogs ☐ Stick ☐ Other _____

l) Castration

Sex	Castration age	Method	Who does it?	Time/ animal	Anesthesia	Analgesia	Antibiotic	%Infection	Deaths
Males									
Females									

m) Are you aware about immunocastration? ☐ Yes ☐ No

n) Have you tested immunocastration? ☐ Yes ☐ No

o) If you have not tested immunocastration vaccine in your animals, what opinion and reasons do you have?

2.5.2 Housings

Stage	Type												Use days	Surface		
	Crate/slat	Crate/concrete	Crate/soil	Individual camping	Group camping	Pen concrete	Pen soil	Pen soil /concrete	Pen slat	Pen slat/concrete	Enclosure without trees	Dehesa	Other	m ² , ha, etc	Individual	Group
Dry sows																
Sows (mating)																
Sows (pregnant)																
Farrowing sows																
Boars without activity																
Boars (mating)																
Piglets																
Rearing pigs																
Growing pigs																
Fatteners (montanera)																
Fatteners (outdoors)																
Fatteners (intensive)																
Gilts																
New boars																

Type of installation used in each stage. Indicate quantity, stay time, surface and mark with X if that surface is for an animal or for the group.

2.6 WASTE MANAGEMENT

2.6.1 Slurry management

Housings	Collection					Storage							Distribution					
	Shovel/wheelbar	Tractor	Water hammer	Pipe	How often?	Pit	Lake	Dung	Compost	Biodigester	Countryside	How long?	Countryside	Own crop	Dehesa	Foreing crop or countryside	Paid collection	Other
Crate/slat																		
Crate/concrete																		
Crate/soil																		
Individual camping																		
Group camping																		
Pen (concrete)																		
Pen (soil)																		
Pen (concrete/soil)																		
Pen (slat)																		
Pen (concrete/slat)																		
Enclosure without trees																		
Dehesa																		
Other																		

Mark with X the method used and indicate time of permanence of slurry in that installation

2.6.2 Do you provide some kind of bed to animals? Yes ☐ (Continue) No ☐ (go to question 2.7)

2.6.3 What material?

- ☐ Sawdust. How much? _____
- ☐ Soil. How much? _____
- ☐ Straw. How much? _____
- ☐ Other _____ How much? _____

2.6.4 How often do you remove the bedding? _____

2.7 BIOSECURITY

- a) Is there enclosure perimeter on your farm? ☐ Yes ☐ No
- b) Is there “sanitary moat” in entrance of farm? ☐ Yes ☐ No
- c) Are special clothes and shoes used to enter in farm installations? ☐ Yes ☐ No
- d) Are the people who visit the farm registered? ☐ Yes ☐ No
- e) Do farm animals have contact with wild animals? ☐ Yes ☐ No

- f) What wild species can be found in this area?
- ☐ Wild boars ☐ Birds
- ☐ Stags ☐ Rabbits or hares
- ☐ Foxes ☐ Rodents
- g) Are there pets on the farm?
- ☐ Dogs ☐ Cats ☐ Dogs and cats ☐ None
- h) How far is another pig farm? _____ km
- i) How are dead animals eliminated?
- ☐ Collection service (one day) ☐ Collection service (accumulation)
- ☐ For vultures (*muladar*) ☐ Incineration
- ☐ For pets ☐ Burial
- ☐ Other _____
- j) Do you regularly wash and disinfect installations? ☐ Yes ☐ No
- k) With which product do you wash or disinfect? _____
- l) Where is foreign livestock received?
- ☐ In different pens (observation or quarantine)
- ☐ No separation of farm's livestock
- m) The groups of animals are mixed:
- ☐ At weaning or entrance
- ☐ After this period

BLOCK C: FARM STRUCTURE

3. SOCIAL ASPECTS and LABOUR

3.1 PERSONAL ISSUES

- a) About owner of the farm:

Age	Nº sons	Nº people who depend on the farm	Nº year in activity

MARITAL STATUS		EDUCATION	
Married	<input type="checkbox"/>	School	<input type="checkbox"/>
Widow	<input type="checkbox"/>	High school	<input type="checkbox"/>
Single	<input type="checkbox"/>	University	<input type="checkbox"/>
Divorced	<input type="checkbox"/>	No study	<input type="checkbox"/>

b) Why are you a farmer? (You can select multiple options)

- ☐ Heredity
- ☐ Family tradition
- ☐ Hobby (pigs)
- ☐ I had no other choice
- ☐ I believed that it's a good business
- ☐ Other _____

c) If you were not pig farmer, where would you work? (You can select multiple options)

- ☐ I would have my business
- ☐ I would have other job in **livestock or agriculture**
- ☐ I would work in **health sector**
- ☐ I would work in **public sector**
- ☐ I would work in **private sector** (company)
- ☐ Other _____

d) What are your personal interests as farm owner? (You can select multiple options)

- ☐ Personal and family support
- ☐ I want to increase revenue
- ☐ I want to buy something (house, car ...)
- ☐ I want to educate my children in countryside
- ☐ I want to retire and travel around the world
- ☐ I want to keep tradition familiar
- ☐ Other _____

e) What are your objectives in pig production? (You can select multiple options)

- ☐ I want to export my products
- ☐ I want to be the best of my region
- ☐ I want to be the best of Spain/Portugal
- ☐ I want to keep tradition
- ☐ I want to grow the business
- ☐ Other _____

f) Do you want to continue in pig production?

- ☐ No
- ☐ Yes, but less than 5 years
- ☐ Yes, more than 5 years

g) In the future, when you become retired:

Do you think your children will continue with pork production? ☐ Yes ☐ No

Will you sell the animals to family member? ☐ Yes ☐ No

Other: _____

h) Is livestock farming your main activity? ☐ Yes ☐ No. Indicate which (sector _____)

i) Main problems:

Importance level	Little					Much				
	1	2	3	4	5	1	2	3	4	5
1. Price of meat										
2. High price of concentrated feed										
3. Decrease subsidies										
4. Administration										
5. Small surface (montanera)										
6. Successors of the farm										
7. Environmental problems										
8. Meat purchases										
9. Health requirements										
10. Veterinary control										
11. Other _____										

3.2 STRUCTURAL DATA

a) When was your farm built? (year)

b) What pig production is done on your farm?

- ☐ Production
- ☐ Selection
- ☐ Gilts and boars to sell
- ☐ Transition of piglets
- ☐ Production of piglets
- ☐ Production of rearing
- ☐ Production of growers
- ☐ Fatteners (☐Montanera ☐Outdoors ☐Intensive)
- ☐ Complete cycle (rearing, growing and finishing pigs)
- ☐ Mixed (piglets and fatteners)

c) What is the productive capacity in your farm?

- ☐ Group 1: until 120 LU
- ☐ Group 2: between 121 LU and up to 360 LU
- ☐ Group 3: between 361 LU and up to 864 LU
- ☐ NA

d) When was the farm adapted to animal welfare regulations? ☐NA

 / /

e) Did the farm have to make any changes to this regulation?

☐No

☐Yes (in this case, you choose one option)

- ☐ Complete cycle by piglets production
- ☐ Reduction number of sows
- ☐ Increase number of sows
- ☐ Other. Specify:

3.3 LABOUR

a) How do you select workers for your farm?

- ☐ I value experience and knowledge
☐ I selected by recommendation from sector colleagues
☐ I contract family members or friends
☐ Other _____

b) Labour data (how many workers do you have contracted?)

Sex	Age	Years	Relationship	Education	Nationality	Salary	Timetable	Holidays

Nº temporary workers _____ N.day's wage/year _____

c) How do you know that workers work well?

- ☐ The manager values them
☐ I set goals
☐ I value final production
☐ I don't make any assessment
☐ Other _____

d) Do you recognize or reward the work of employees? ☐ Yes ☐ No

e) How?

- ☐ Money
☐ Gift
☐ Symbolic
☐ Verbally
☐ I don't reward them
☐ Other _____

f) What training do your employees perform?

Personal	Type (course, online, conferences...)	Frequency	Topic (Health, production, welfare animal o labour risk)

g) What percentage of the work your employees dedicate to pork activity? _____%

4. FARM MANAGEMENT

a) Association level

- ☐ AEERIBER
☐ BREED (indicate: _____)
☐ ADS
☐ FARMERS ORGANIZATION/UPA (indicate: _____)
☐ COOPERATIVES
☐ Others(indicate:_____)

b) Are you frequently registering information of farm? ☐ Yes ☐ No

c) What information is recorded? *(You can select multiple options)*

- ☐ Accountant and financier
☐ Movements of animals (entries and outputs)
☐ Inseminations and mating
☐ Data births and litters
☐ Deaths (causes)
☐ Weights
☐ Weight daily gain
☐ Feed consumption
☐ Data vaccination
☐ Data deworming
☐ Diseases and treatments

d) Why do you register this data? *(You can select multiple options)*

- ☐ History
☐ Reference
☐ Evaluate changes on farm
☐ Evaluate work of employers
☐ Requirement (veterinarian or association)
☐ Farm control
☐ Others reasons_____

e) Advice company:

Adviser	Type (reproductive/technical/ accountant/other)	Visit/year	Conditions
Veterinarian			
Other professional: _____			
Other expert: _____			

f) What information sources do you regularly consult? *(You can select multiple options)*

- ☐ Newsletters
☐ Magazines
☐ Brochures
☐ Technical advice
☐ Livestock meetings
☐ Technical meetings
☐ Internet
☐ Recommendations (family or friends)
☐ Other_____

g) Why do you use this information? (*You can select multiple options*)

- ☐ Information and treatment about diseases
- ☐ Innovation in pig production
- ☐ To compare with my farm management (benchmarking)
- ☐ To modify my farm management following a reference
- ☐ Save money
- ☐ I don't hire technical services
- ☐ Met regulations
- ☐ Other: _____

h) What improvement plans does the farm have at present?

- ☐ Genetic improvement
- ☐ Transition to organic livestock
- ☐ Staff training
- ☐ Installations improvement
- ☐ Dietary change
- ☐ Expansion farm
- ☐ Transition to intensive livestock
- ☐ None

5. ECONOMIC ASPECTS AND COMMERCIALIZATION

5.1 COMMERCIALIZATION, SALES AND INCOME

Sales of animals

Type of animal	Number	Average weight	Average age	Price/animal	Form of sale*
Piglets					
Rearing pigs (<i>marrano</i>)					
Growing pigs (<i>primal</i>)					
Fatteners in montanera					
Fatteners in outdoors					
Fatteners in intensive					
Culling animals					
Gilts					
Boars					
Other (_____)					

*Industrial, supermarket, butcher, cooperative, direct sale, other

a) Do your animals' products belong to some PDO? ☐ Yes, which? _____ ☐ No

b) Do your animals' products meet national regulation (Norma del Ibérico)? ☐ Yes ☐ No

Slaughter

Process	Slaughterhouse (own, municipal or private)	Distance (Km)	€ / animal
Slaughter			
Quartering			
Dryer			

Sale of agricultural products

	€/year	Kg	€/kg
Cereals			
Legumes			
Straw or Hay			
Harvest by-products			
Other			

Sales of animal by-products

	€/year	kg	€/kg
Manure			
Slurry			
Other			

Subsidies

	€/year	Nº animals	€/animal
CAP			
Native breed			
Extensification (pastures)			
Organic livestock			
Dead animals collecting			
Other			

5.2 COSTS

Purchase of animals

Type of animal	Number	Price	Origin	Distance	Travel time	Means of transport	Deaths
Gilt / sow							
Boar							
Piglets							
Rearing/growing pigs (marrano, primal)							
Other (_____)							

Animal supplement and feedstock for agriculture

Feed or feedstock*	Origin			Quantity (kg)	Price (€/kg)
	Own	Purchase	Where?		

*Concentrated feed, by-products, cereal, seeds, straw, hay, other

External services	€/ year	€/ animal
Administration		
Veterinarian		
Tax adviser		
Insurances		
Norma Inspector		
P. D. O.		
AECERIBER		
Slurry collecting		
Other		

Supplies	€/month
Fuels	
Electricity	
Water	
Phone	
Medicines	
Other	

Reparations and conservation (€/year) _____

Land rent (€/year) _____

Installations rent (€/year) _____

Machines rent (€/year) _____

Financial expenses

FINANCIAL PRODUCT	Loan	Coverage	Mortgage
Indebtedness total(€)			
Interest rate (%)			
Annual payment (€/year)			

Taxes	€/year
IBI	
IRPF o ISS	

BLOCK D: OBSERVATONS

Table S1. Chemical composition of feed formulas and natural resources and feed ingredients incorporated of each feed formulas.

Chemical composition (g/kg)	<i>Sow</i>		<i>Piglets-weaners</i>		<i>Growers</i>		<i>Fatteners cebo campo</i>				<i>Natural resources ^c</i>	
	Gestating ^a	Lactating ^a	Starter ^a	Transition ^a	Gr 1 ^a	Gr 2 ^b	Fat 1 ^a	Fat 2 ^b	Final Fat ^a	Quality Fat ^b	Acorn	Grass
CP	140.4	173.2	157.5	166.3	154.9	161.4	115.3	157.4	107.9	150.9	58.80	222.0
OM	849.5	851.4	859.3	852.8	849.6	849.0	854.9	851.4	855.2	853.3	978.0	852.0
OMd	661.9	645.6	654.6	657.4	651.1	636.6	653.8	596.93	643.08	601.78	856.7	746.4
ResD	85.64	83.52	73.80	80.06	81.99	84.74	74.69	76.38	72.86	75.42	28.26	550.8
P	3.46	3.54	4.84	3.44	3.47	4.66	3.11	3.80	3.00	4.29	0.80	1.42
Ingredients (kg/Tn)	<i>Sow</i>		<i>Piglets-weaners</i>		<i>Growers</i>		<i>Fatteners cebo campo</i>					
	Gestating ^a	Lactating ^a	Starter ^a	Transition ^a	Gr 1 ^a	Gr 2 ^b	Fat 1 ^a	Fat 2 ^b	Final Fat ^a	Quality Fat ^b		
Soybean meal Brazil	94.24	179.2	163.8	159.6	128.9	117.0	31.70	53.00		26.00		
Spring pea Spain						60.00		125.00		150.0		
Sunflower oil Spain										57.00		
Wheat Spain	194.4	300.0	200.0	250.0	250.0	300.0	237.1	549.6	308.6	449.6		
Maize Spain	47.33	121.6	300.0	200.0	129.0		170.2	100.0	168.5	100.0		
Barley Spain	620.0	337.1	246.5	332.4	450.0	473.5	500.0	120.0	459.6	195.0		
Lard	12.93	30.28	29.80	21.33	10.00	28.00	21.00	32.00	23.34			
Salt			4.50			4.00		4.00		4.00		
Bicalcium phosphate			8.44			6.00		3.00		3.00		
Calcium carbonate			2.78			7.00		8.50		11.00		
L-lysine	1.08	1.65	2.65	4.33	1.83	1.50		1.90		1.40		
L-threonine		0.17	0.67	1.65	0.29							
L-valine			0.53									
L-methionine			0.37	0.66								
Premix	30.00	30.00	40.00	30.00	30.00	3.00	40.00	3.00	40.00	3.00		

Crude protein (CP). Organic matter (OM). Digestibility organic matter (OMd). Digested fibre content (ResD). Growing feed (Gr). Fattening feed (Fat).

^a Compound feed produced by Company 1.

^b Compound feed produced by Company 2.

^c FEDNA [36]; García-Valverde et al. [34,40]; Rodríguez-Estévez et al. [32]; Vázquez et al. [35].

Table S2. Data Iberian pig farms.

	Mean	Standard deviation	Minimum value	Maximum value
<i>Surface</i>				
Farm, ha	670.3	636.2	28.5	3000
Dehesa, ha	528.9	437.8	18	2000
<i>Number of sows/farm</i>	34.41	25.23	10	100
<i>Number of boars/farm</i>	4.00	3.79	1	14
<i>Number of fatteners/farm</i>				
Montanera	213.8	141.3	25	700
Cebo campo	213.3	256.2	35	700
<i>Sows</i>				
Total born/ farrowing, number	8.33	0.89	7	10
Born alive/ farrowing, number	7.55	0.60	6.5	8
Weaned/ farrowing, number	6.17	0.74	4.5	8
Weaning weight, kg	11.58	4.40	5.2	23
Weaning age, days	45.32	12.91	25	90
<i>Fatteners</i>				
Slaughter LW, kg	178.7	11.23	160	200
Age at slaughter, months	18.63	2.05	14	22.5

Number of farms (n=33). Number farms montanera (n=27). Number farms montanera and cebo campo (n=6).