

# Pig meat production Carbon Footprint



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Services

## Life Cycle Assessment

LOC offers this experience to make environmental assessments of a product through the application of LCA methodology and the correct interpretation and application of the LCA results

## Eco Design

#### Communication

### **Environmental Consultancy**

LCE develops consuming services

## LATEST NEWS

#### EPD ON WASA HUSMAN NOW AVAILABLE

05/10/2011

LCE supported Barilla in the realization of the Environmental Product Declaration of Wasa Husman. For more information see www.environdec.com

#### EPD ON CRACKER NON SALATI NOW AVAILABLE

24/08/2011

www.environdec.com

#### EPD ON ARMONIE FETTE BISCOTTATE DORATE NOW **AVAILABLE**

24/08/2011 www.environdec.com

#### LCA manual



#### Featured projects

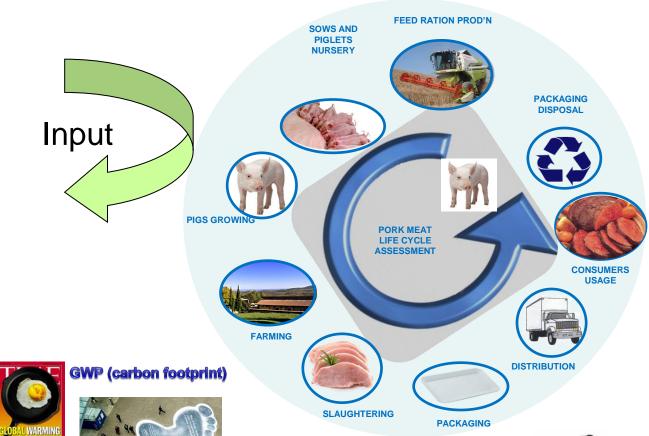


LCA and EPD of a vaccine against boar taint

Pig meat production Carbon Footprint

# WHAT is a Life Cycle Assesment (LCA)

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**Gross Energy Requirement** 



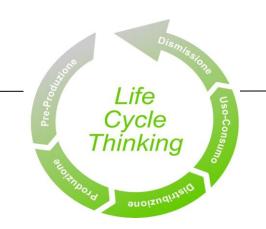


**Additional information** 

# WHY doing a Life Cycle Assesment (LCA)

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comparisons on scientifically generated data



R&D

To identify specific issues

## **COMMUNICATION**

Providing detailed, reliable and robust information to support the environmental communication

The "Six Sins of Greenwashing" A Study of Environmental Claims in North American Consumer Markets



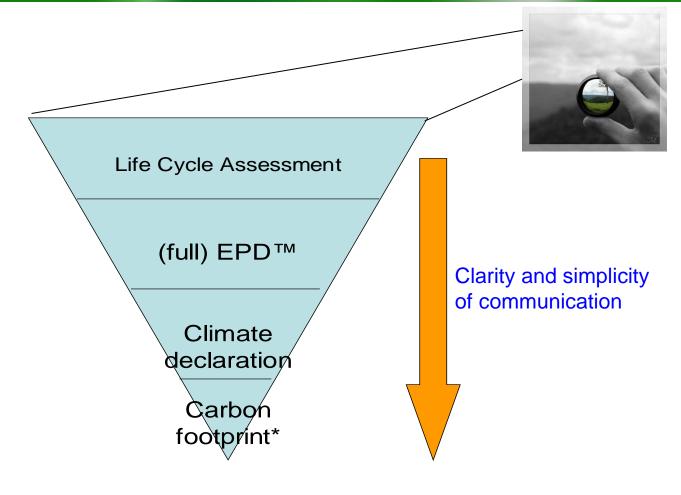
## SIMULATION & ECO-DESIGN

To support changes into the system for improvement



# From LCA to Carbon Footprint

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| CARBON FOOTPRINT | CEMISSION expressed as CO<sub>2</sub>-equivalents | CO<sub>3</sub> | CPC code 34920 | CARBON FOOTPRINT | CEMISSION expressed as CO<sub>2</sub>-equivalents | CARBON FOOTPRINT | CEMISSION | CEMISSION

For more information – www.environdec.com

LCA and EPD of



## **Carbon Footprint and Pig Meat Production**

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The Carbon Footprint represents the total amount of greenhouse gas (GHG) emitted either directly or indirectly by human activity throughout overall life-cycle. It is expressed in equivalent tons of CO2



PAS 2050:2008



ISO 14064:2006

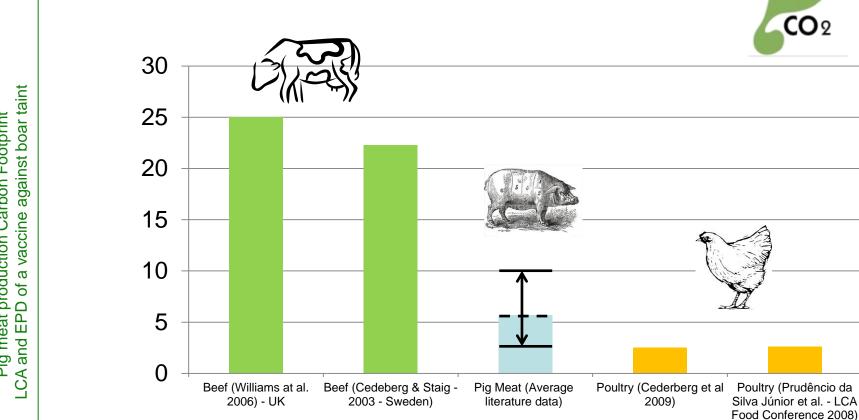
Reference	Country	kg CO <sub>2</sub> e/kg Weight (carcass)
Basset-Mens & van der Werf (2005)	France	2,3
Cederberg & Flysjo (2004)	Sweden	4,4
RIRDC (2010)	Australia	3,1-5,5
Cederberg m.fl. (2009b)	Sweden	5,2
UAASC (2010)	USA	7-10,2*
Williams et al. (2006)	UK	5,6- 6,4



[\*boneless meat, including packaging, retail and consumption-cooking]

## **Carbon Footprint and Pig Meat Production**

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Pig meat production Carbon Footprint



## The Specific LCA Project of Pfizer

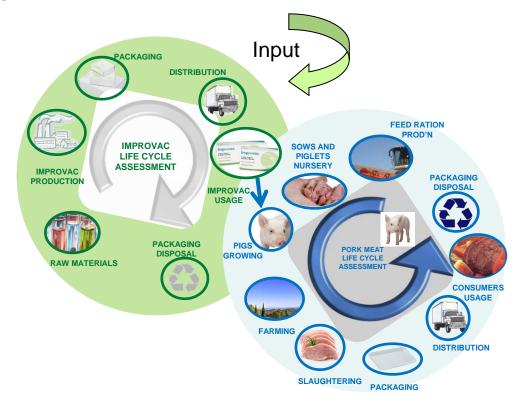


Produce reliable data about the environmental burden of an average farm that uses and that doesn't use the immunological product for boar taint reduction

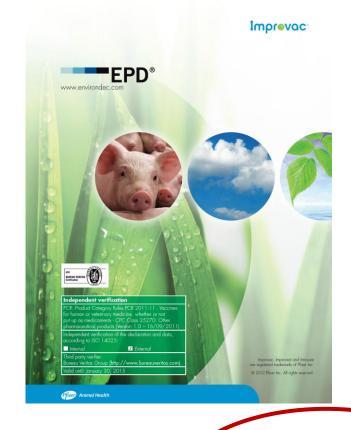
Develop a specific study applied to pig breeding with particular regard to male pig;

Analyze the use phase of an immunological product for boar taint reduction

Understand and quantify any possible environmental benefit of using it









ISO Type III Environmental labelling Quantified environmental life cycle ISO 14025 product information (not selective)





## THE SYSTEM

Figure 1. Scheme of the considered system boundaries (including upstream, core and downstream main processes). SYSTEM BOUNDARIES Slaughterhouse **DOWNSTREAM UPSTREAM PROCESSES CORE PROCESS PROCESSES** 000 DEAE Dextran production Meat prod'n **Facility** Improvac Conjugate prod'n Kalamazoo (US), Louvain la Neuve Pig breeding Preservative prod'n and rearing (Belgium) and Melbourne (Australia) plants Improvac use phase (2 doses) and Improvac Cap and bottle prod'n packaging end of Packaging production life management Packaging process Auxiliary materials Improvac transport to the farms

## **FUNCTIONAL UNIT DEFINITION**

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VACCINE PRODUCTION:

UPSTREAM & CORE

USE PHASE (FARM) LEVEL

**DOWNSTREAM** 

END OF LIFE (SLAUGHTERHOUSE)

**DOWNSTREAM** 

2 doses of immunological product

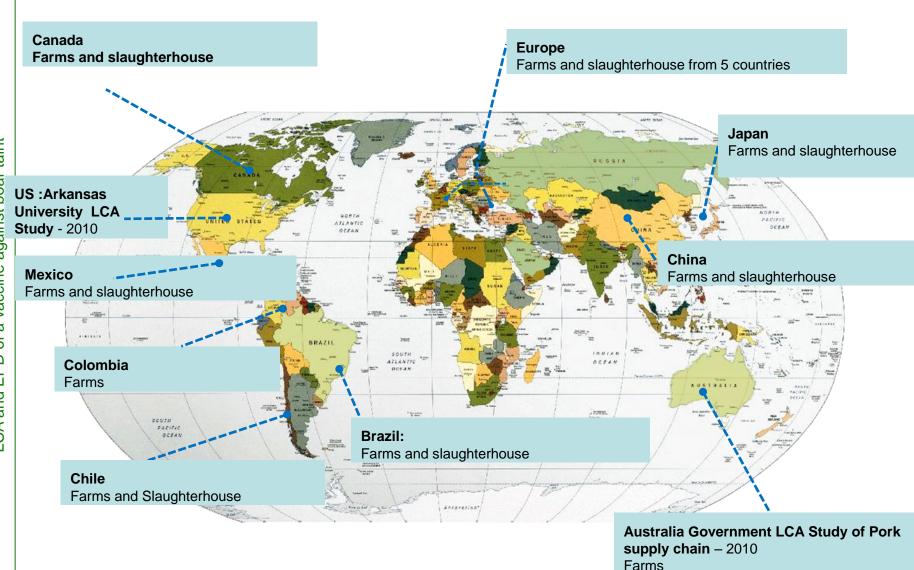
2 doses used per male pig

It is the pig ready for slaughter (live-weight) and the unit mass of final product (meat)

Pig meat production Carbon Footprint LCA and EPD of a vaccine against boar taint

# **Data collected globally**

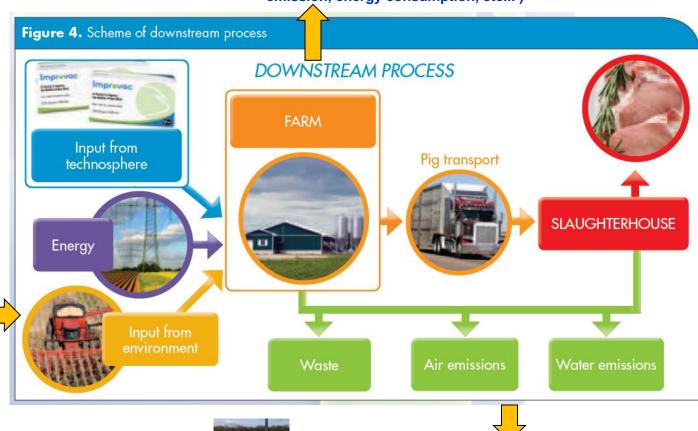
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## Farm Model: vaccine use phase

Farm management (Sow management, Pig housing emission, energy consumption, etc...)



I Ration given to pigs
I (Typology,
composition, quantity)

Crop and feed Production



Slurry management- final destination

Air and water emissions calculated on the basis of different slurry management system applied in the farms (IPCC Guidelines).

## **Animal Feed Production Data**

## **Crop and feed Production**



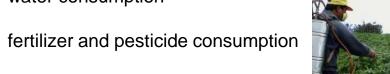
Data are related to crop activities from specific regional data



crop yield



water consumption



land operation





These parameters are specific for each country and each feed component

## **Slurry Management**

- Pit storage
- Solid storage
- Daily spread
- Liquid storage without crust cover
- Liquid storage with crust cover
- Dry lot
- Anaerobic lagoon

- Slurry management alternative practices are **specific** for each country.
- Data related to slurry composition are specific for each country



of

LCA and EPD



## **RESULTS: CARBON FOOTPRINTING**

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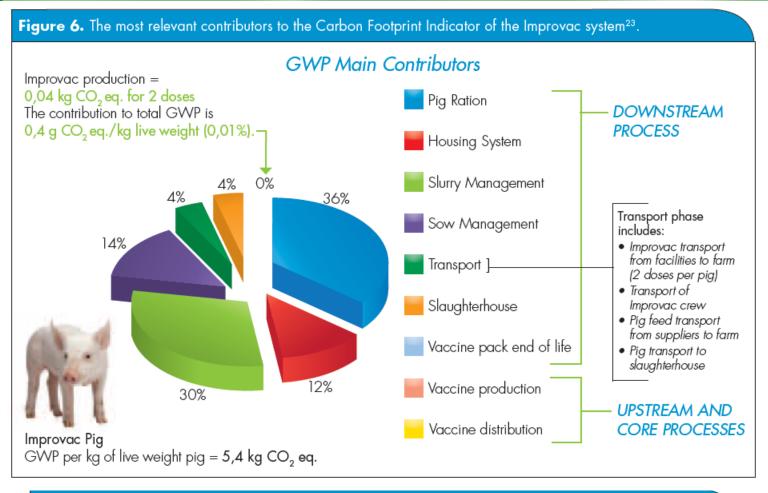


Table 6. Carbon Footprint for the three functional units considered in the LCA for Improvac (rounded data).						
IMPACT INDICATORS		1 kg of pig live weight	1 kg of pig carcass after dressing	1 kg of lean meat		
Global Warming Potential (GWP) [Carbon Footprint]	kg CO <sub>2</sub> equiv.	5,4	7,0	12,8		



# **Barrows vs Vaccinated Boars**

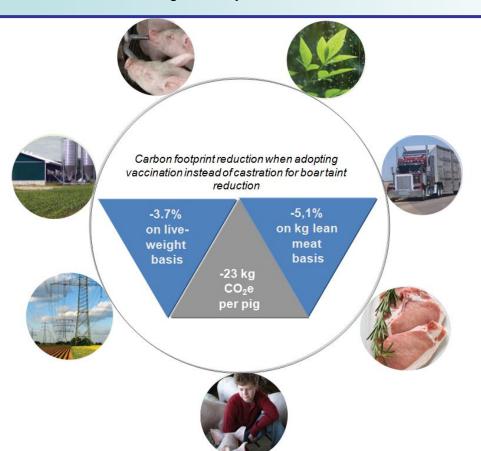
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## **CARBON FOOTPRINT**

Barrows = 5,57 kg CO2 eq

Boars vaccinated for boar taint = 5,36 kg CO2 eq







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Costs

Saving

Meat carbon footprint reduction initiatives at farm level and related costs and savings.

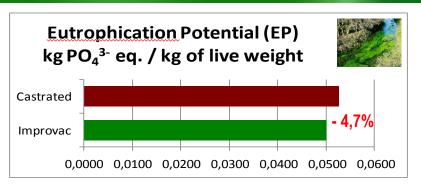
**Action** Vaccine use Renewable energy Slurry anaerobic digestion Purchase CER CER

Certified emission reduction CER \$/CO2saved No Yes

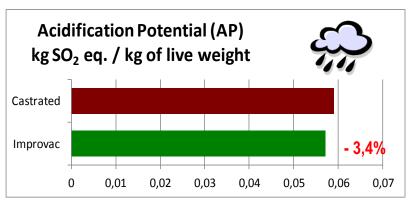
The vaccine use scenario is based on a balance between cost of vaccine and savings associated with non-physical castration and reduction of feed

**Investment** (plant)

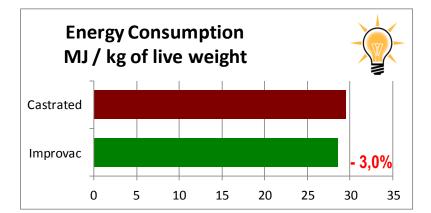
## Additional Results



**Eutrophication Potential (EP)** index measure the release of sulphur, nitrogen, phosphorous and degradable organic substances into the atmosphere and water courses; it may cause nutrient enrichment (eutrophication), which in turn may result in algal blooms and decrease the water quality,



Acidification Potential (AP) index measure the phenomenon by which atmospheric rainfall has a lower pH (due to the emissions of SO2, NOx, and NH3). This may cause damage to forests and crops, as well as to water ecosystems and objects in general



**Energy associated** to the functional unit of product or production system considered, referred to the gross or cumulative totals when all operations are traced back to the extraction of raw materials from the earth.



# Pig meat production Carbon Footprint CA and EPD of a vaccine against boar taint

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## Thank you for your attention

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