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SALSA-MEXICO

Mexican Beef Production Chains LCA RESULTS

M Salud Rubio Lozano, Rafael Olea Pérez, Adriana Rivera,
Gerardo Carrillo, Luis Felipe Quiroz, Myriam Pérez y Nelly Peña
UNAM-TEAM Mexico



TROPICAL CATTLE.

A DIFFERENT TYPE OF MEAT

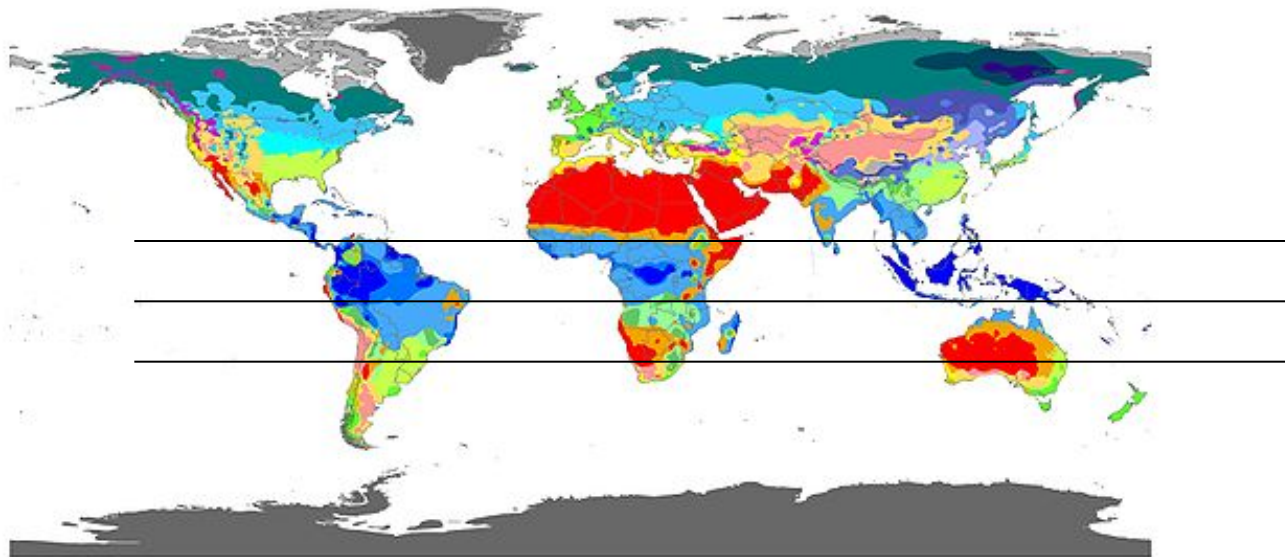


TROPICS



Constant high temperature (at sea level and low elevations) — all 12 months of the year have average temperatures of 18 °C or higher

World map of Köppen-Geiger climate classification



Equator



Blue	Af	Red	BWh	Yellow	Csa	Light Green	Cwa	Light Yellow-Green	Cfa	Pink	Dsa	Light Blue	Dwa	Cyan	Dfa	Grey	ET
Dark Blue	Am	Light Pink	BWk	Yellow-Green	Csb	Green	Cwb	Light Green	Cfb	Pink	Dsb	Dark Blue	Dwb	Light Blue	Dfb	Dark Grey	EF
Light Blue	Aw	Orange	BSh	Dark Green	Cwc	Green	Cfc	Purple	Dsc	Dark Blue	Dwc	Dark Green	Dwc	Dark Green	Dfc		
Yellow	BSk							Purple	Dsd	Dark Purple	Dwd	Dark Blue	Dwd	Dark Blue	Dfd		

Contact : Murray C. Peel (mpeel@unimelb.edu.au) for further information

DATA SOURCE : GHCN v2.0 station data
Temperature (N = 4,844) and
Precipitation (N = 12,396)

PERIOD OF RECORD : All available

MIN LENGTH : ≥30 for each month.

RESOLUTION : 0.1 degree lat/long



TROPICAL COUNTRIES



México, Central America, Colombia, Ecuador, Peru, Bolivia, Venezuela, Guyana, Surinam, French Guyana, North of Chile, Argentina, Paraguay and Brasil



Dry region

Warm climate

Tropics

Veracruz



TROPICAL PRODUCTION PILARS

- PASTURES
- BOS INDICUS





Bos indicus

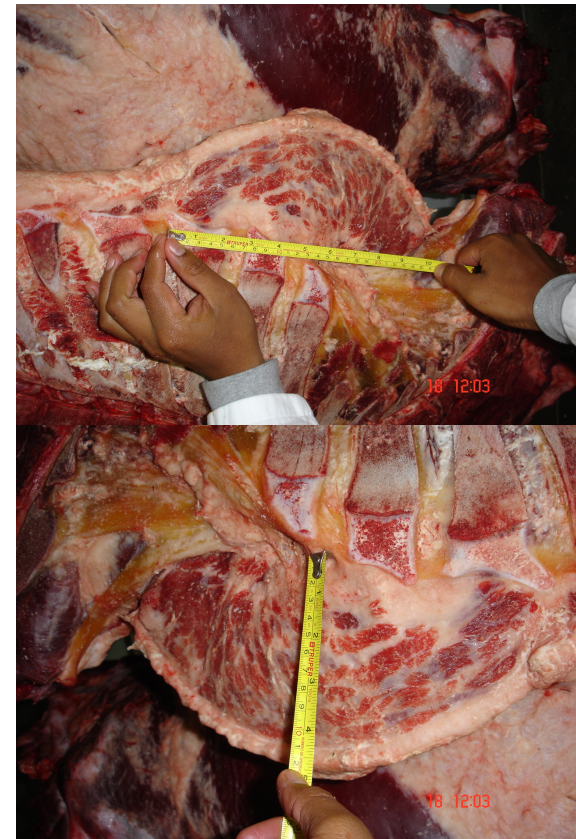
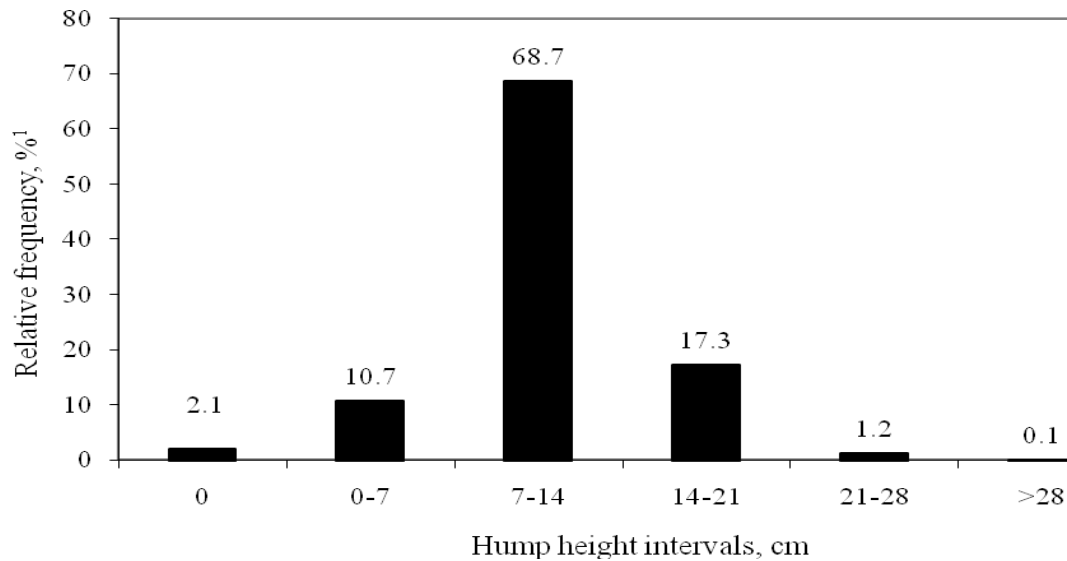


- Heat resistant
 - More and thick skin
 - More sweat glandules
 - Less subcutaneous fat
- Meat
 - Low carcass yield
 - Low IM fat
 - Tougher meat
 - Darker red
- Young bulls

Mendez et al (2009): **90%** of commercial cattle has strong *Bos indicus* influence



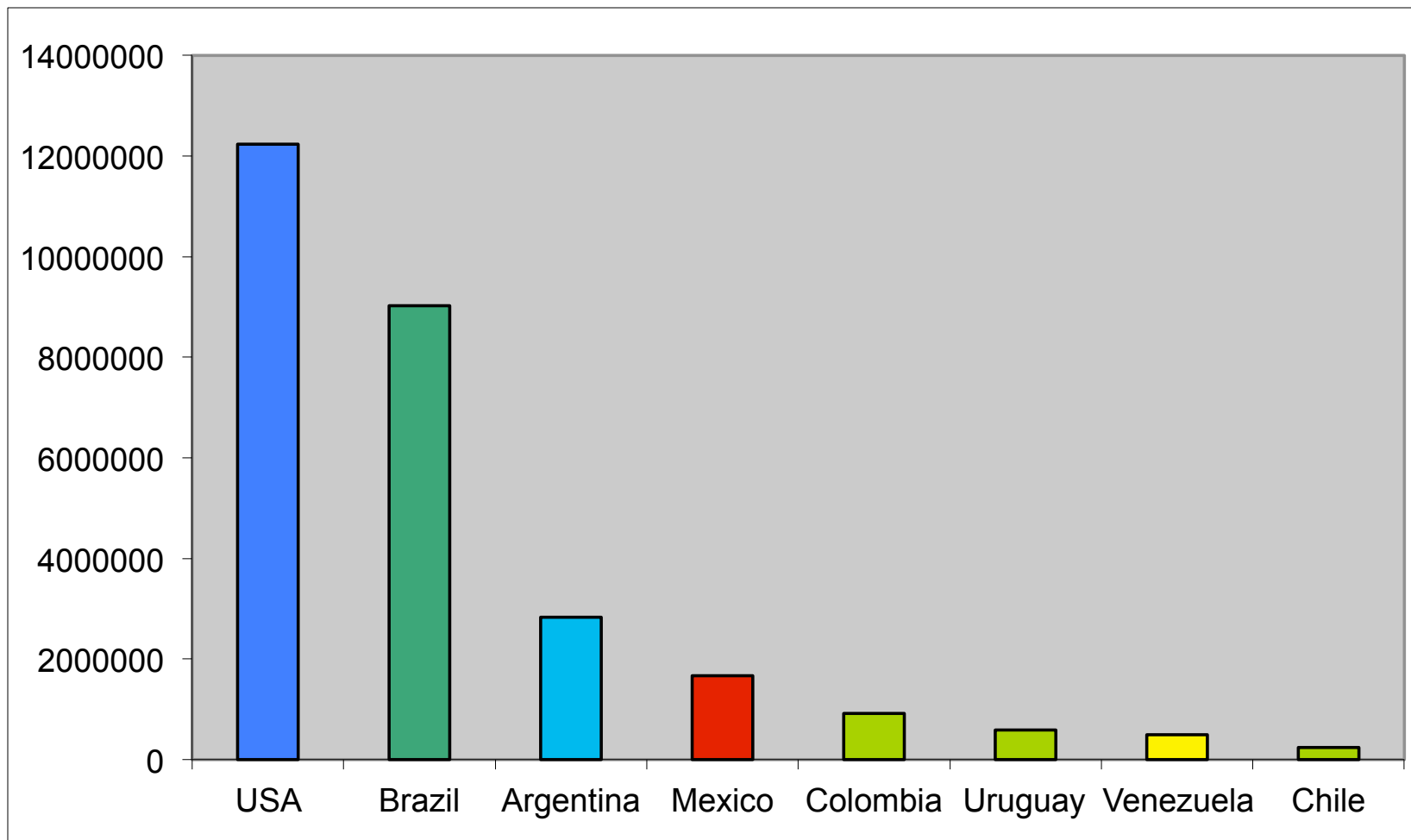
87.2% with hump > 7 cm



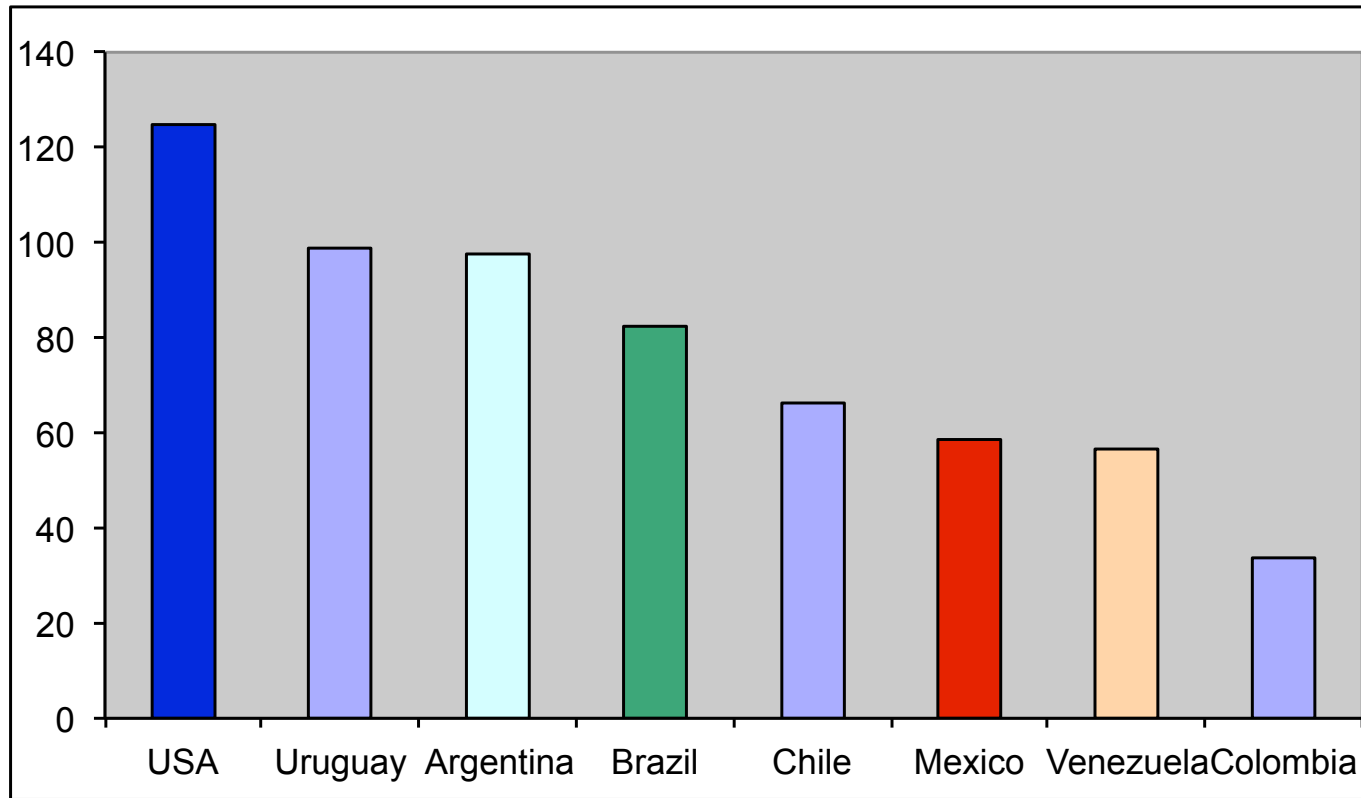
LATINAMERICA




BEEF PRODUCTION, MTn



MEAT CONSUMPTION

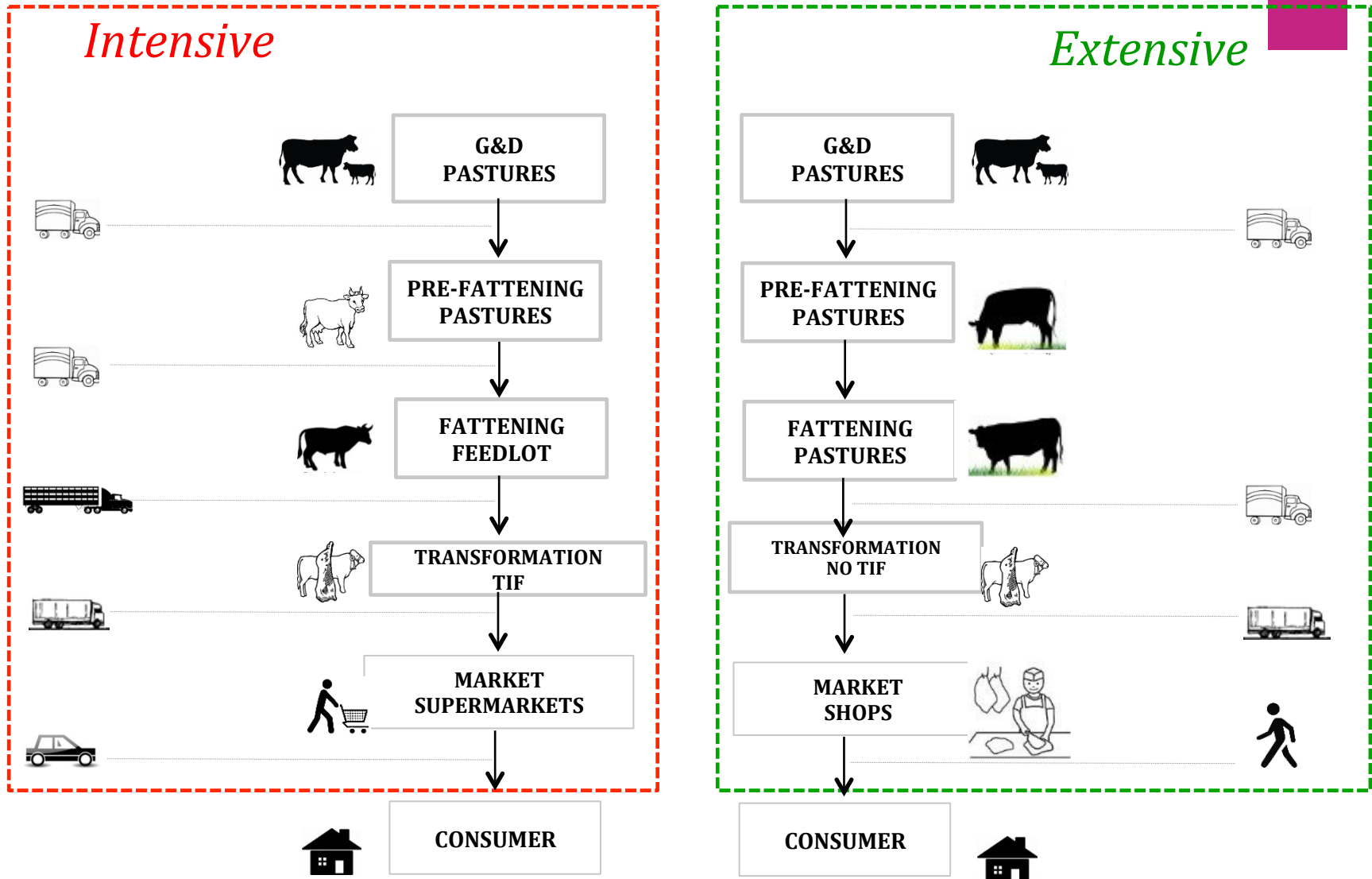


Country	Beef (kg/person/ year)	Pork	Poultr y	Mutto n	Total
United States	44	31	48	1	123
Germany	16	54	15	1	86
Italy	26	35	19	2	82
Argentina	58	-	21	1	80
United Kingdom	16	25	27	6	74
Brazil	36	9	24	-	70
New Zealand	37	-	-	29	66
Mexico	21	10	20	2	53
China	5	35	11	2	53



Environmental impact evaluation of the Beef production chains in Mexico (Veracruz and Tabasco) using LCA

Beef Chains



Life Cycle Analysis

Bounderies

- **Spacial limit:** North-Center of Veracruz.
- **Time limit:** 1 year for bussiness operation
- **Production process limits:** the analysis include the following phases: growth and development, pre-fattening, fattening, transformation and market.

Life Cycle Analysis

Boundaries



- **System limits**
 - ✓ Feed inputs
 - ✓ Energy
 - ✓ Fertilizers and pesticides
 - ✓ Residues management
- **NOT INCLUDED:** production and maintenance of capital goods, production, consumption and emissions of drugs and cleaning products.

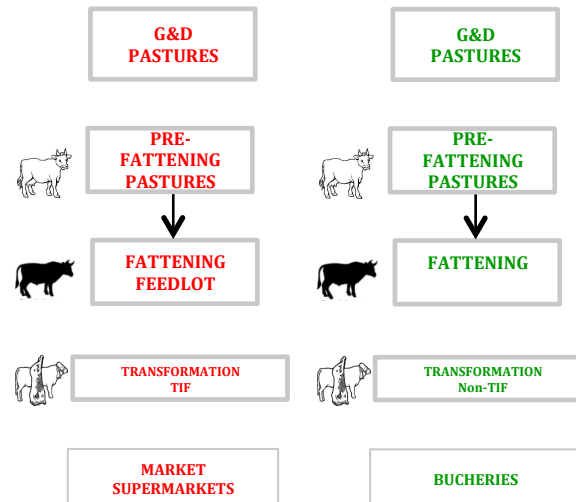
Functional Unit

1 kg of boneless, fatless meat at the consumer home



Inventory Analysis

- **Two study cases** were selected per process and type of chain
- Data recollection was addressed by **direct interviews** to beef production chain actors using semi-structured questionnaires



G&D: Breeding (W at birth 37 kg) until reaching 224 kg.
Same for both chains.

Pre-fattening (Pf):

Intensive: 190 d, pasture and supplements---336 kg

Extensive: 243 d, pasture no supplement--348 kg

Fattening (Fat):

Intensive: 107 d in feedlots---- 514 kg

Extensive: 213 d, pasture with supplement---455 kg

Transformation (Tr):

Intensive: Modern—carcass yield 59% (17% debone)

Extensive: Traditional---carcass yield 52%.







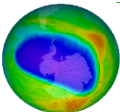

Market (Mark):

Intensive: Boxed beef (bone and fat less). Decrease 8.9%.

Extensive: Carcasses. Decrease of 45%

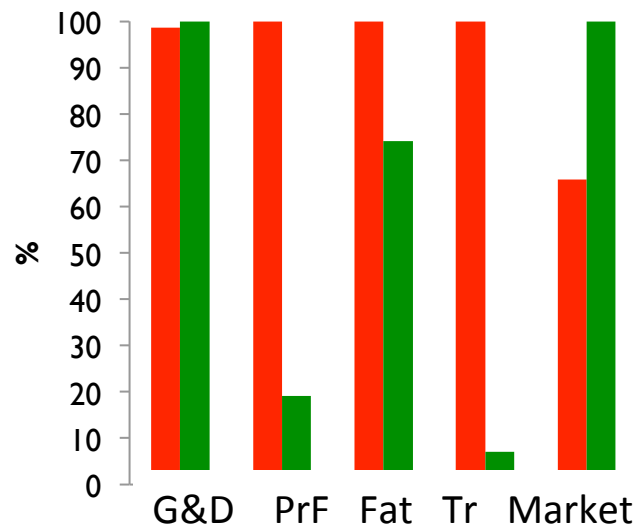
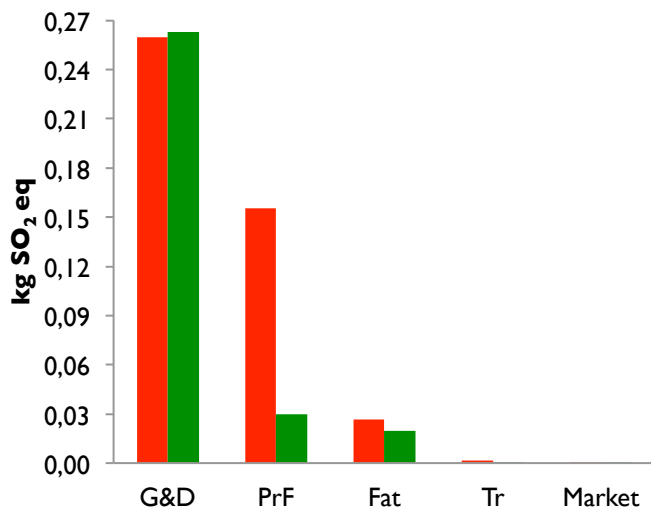


Impact categories

Acidification (kgSO ₂ eq) 	Humane Toxicity (Kg 1,4-Dbeq) 
Eutrofization (kg PO ₄ eq) 	Fotochemical Oxidation (Kg C ₂ H ₄ eq) 
Global climate change (kg CO ₂ eq) 	Water use (L) 
Ozone layer decrease (KgCF ₂ eq) 	Land use (m ²) 

Acidification

■ Intensive ■ Extensive



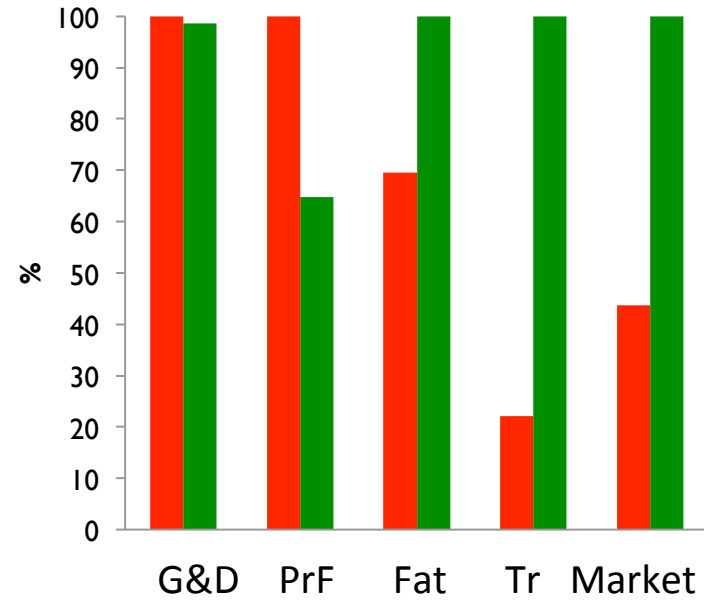
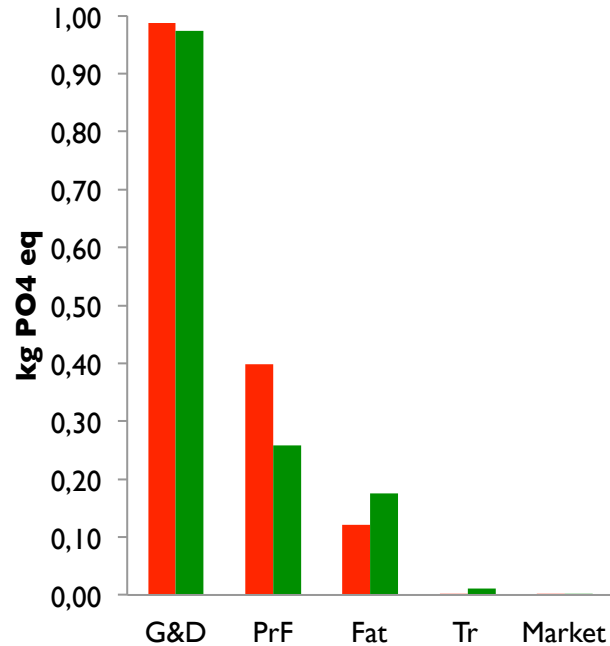
Pre and Fattening > impact in INTENSIVE for the maize factor (requires fossils fuel, fertilizers and pesticides)

Transformation > impact in INTENSIVE for the use of electricity in TIF

Market > EXTENSIVE for the less efficient use of electricity

Eutrophication

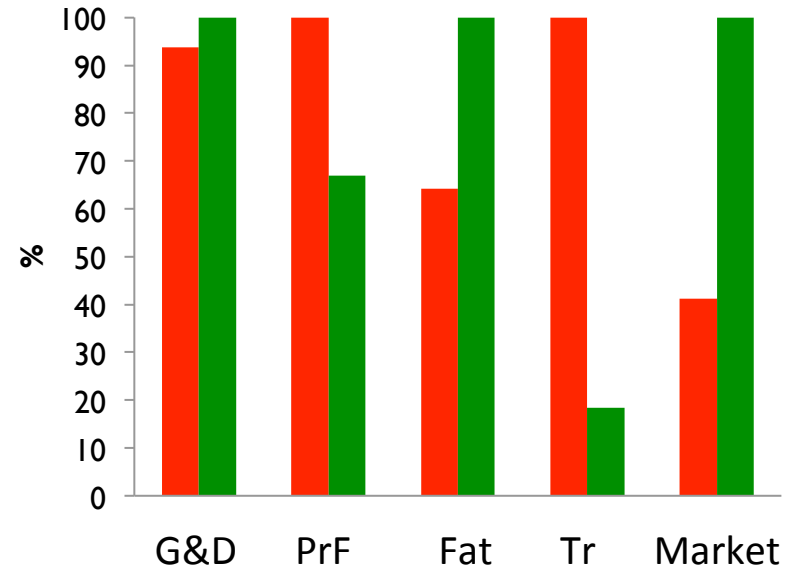
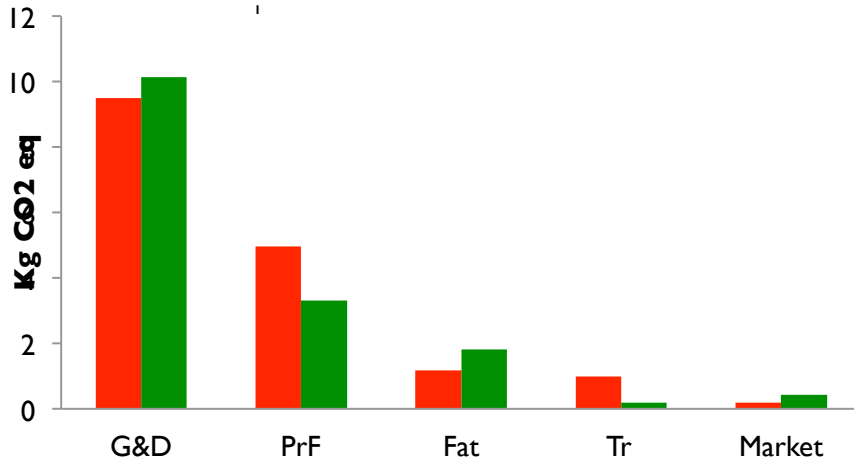
■ Intensive ■ Extensive



- **Pre-fattening** INTENSIVE > impact due to fertilizers
- **Fattening** EXTENSIVE > impact → no manure management
- **Fattening** INTENSIVE < impact → manure is applied to land. However, maize and other components of the diet make a greater impact in Eutrophication from fertilizers.
- **Transformation** EXTENSIVE > impact due to non-treated residual liquids and manure
- **Market** EXTENSIVE > impact due to the use of electricity

CLIMATE CHANGE

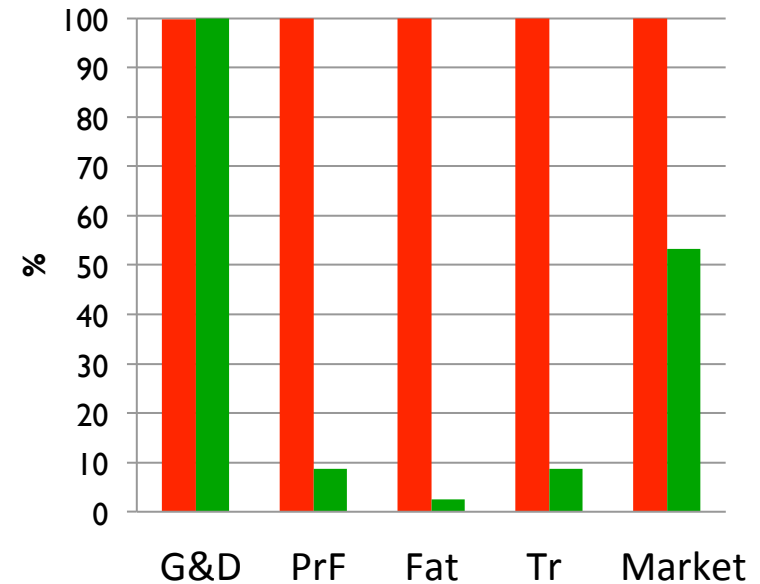
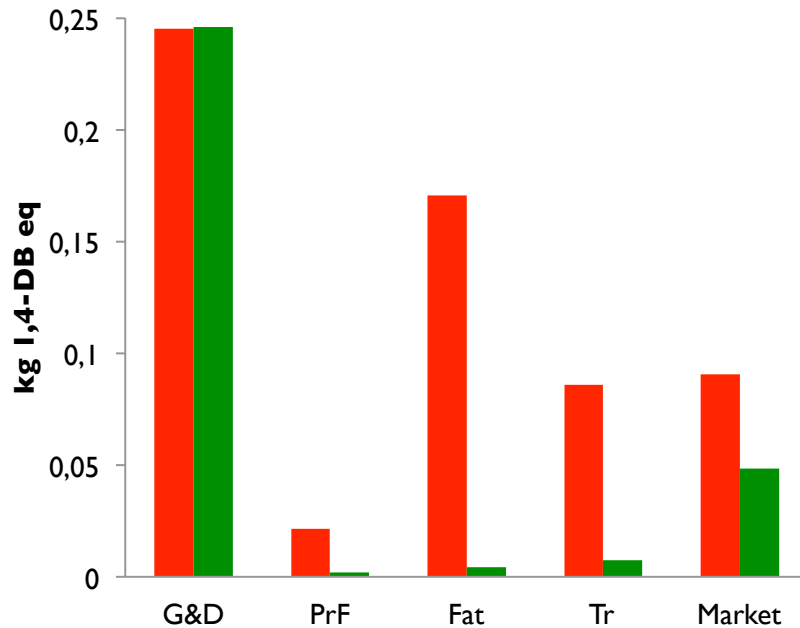
■ Intensive ■ Extensive



- **Pre-fattening** INTENSIVE > impact for fertilizers and maize
- **Fattening** EXTENSIVE > impact due to pasture and longer time to achieve final weight
- **Transformation** INTENSIVE > impact due to packaging and electricity
- **Market** EXTENSIVE > impact due to the use of electricity

Human toxicity

Intensive Extensive

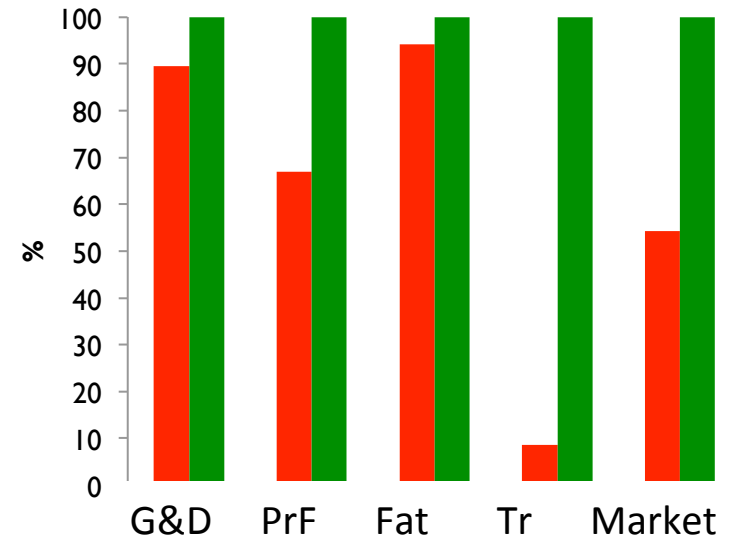
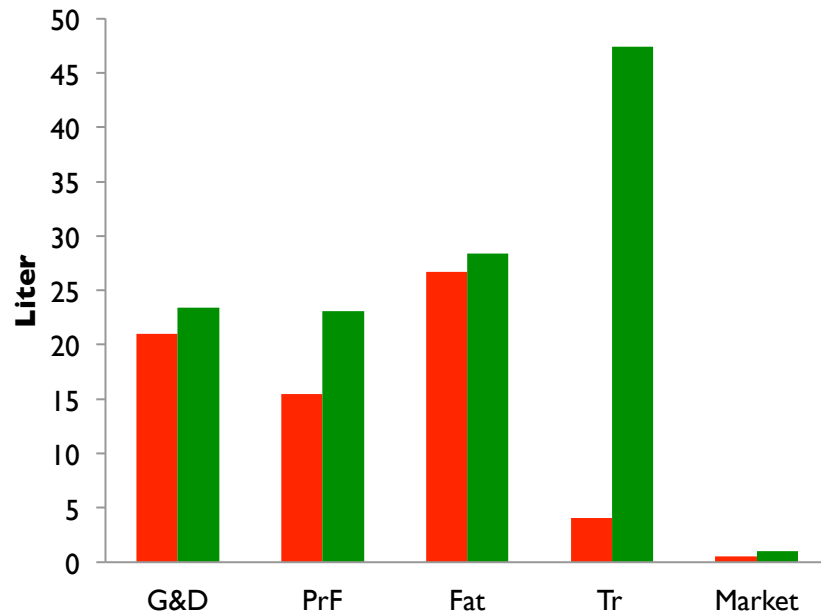


Bigger impacts in the INTENSIVE chain

Water use

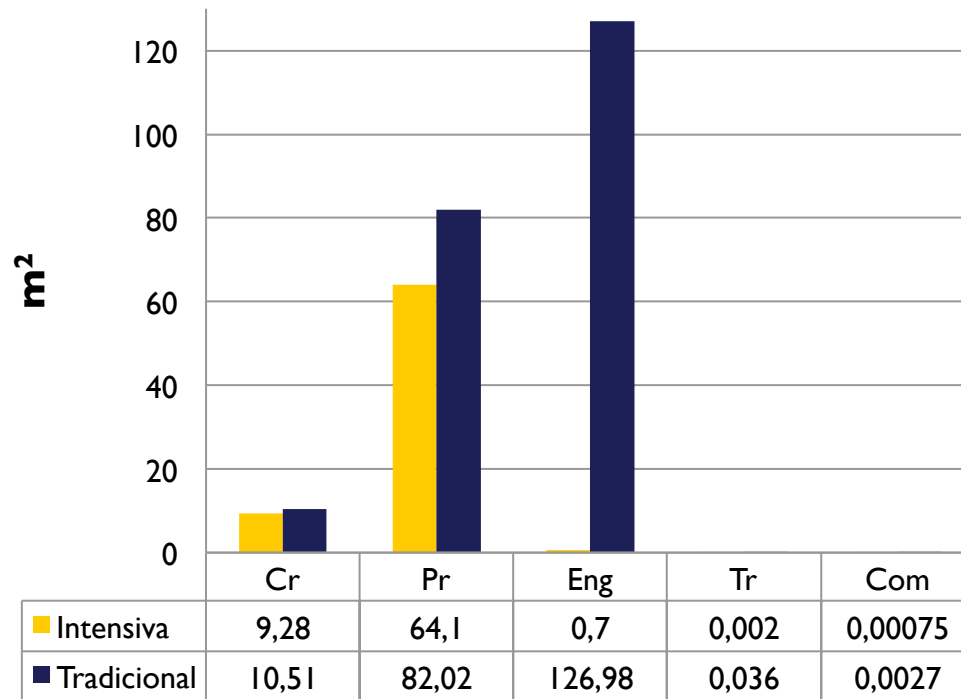


■ Intensive ■ Extensive



- **Production** EXTENSIVE > consumption of water for longer periods
- **Transformation** EXTENSIVE > impact due to lack of tecnification, no-trained personnel and non-standarized processes.

Land use



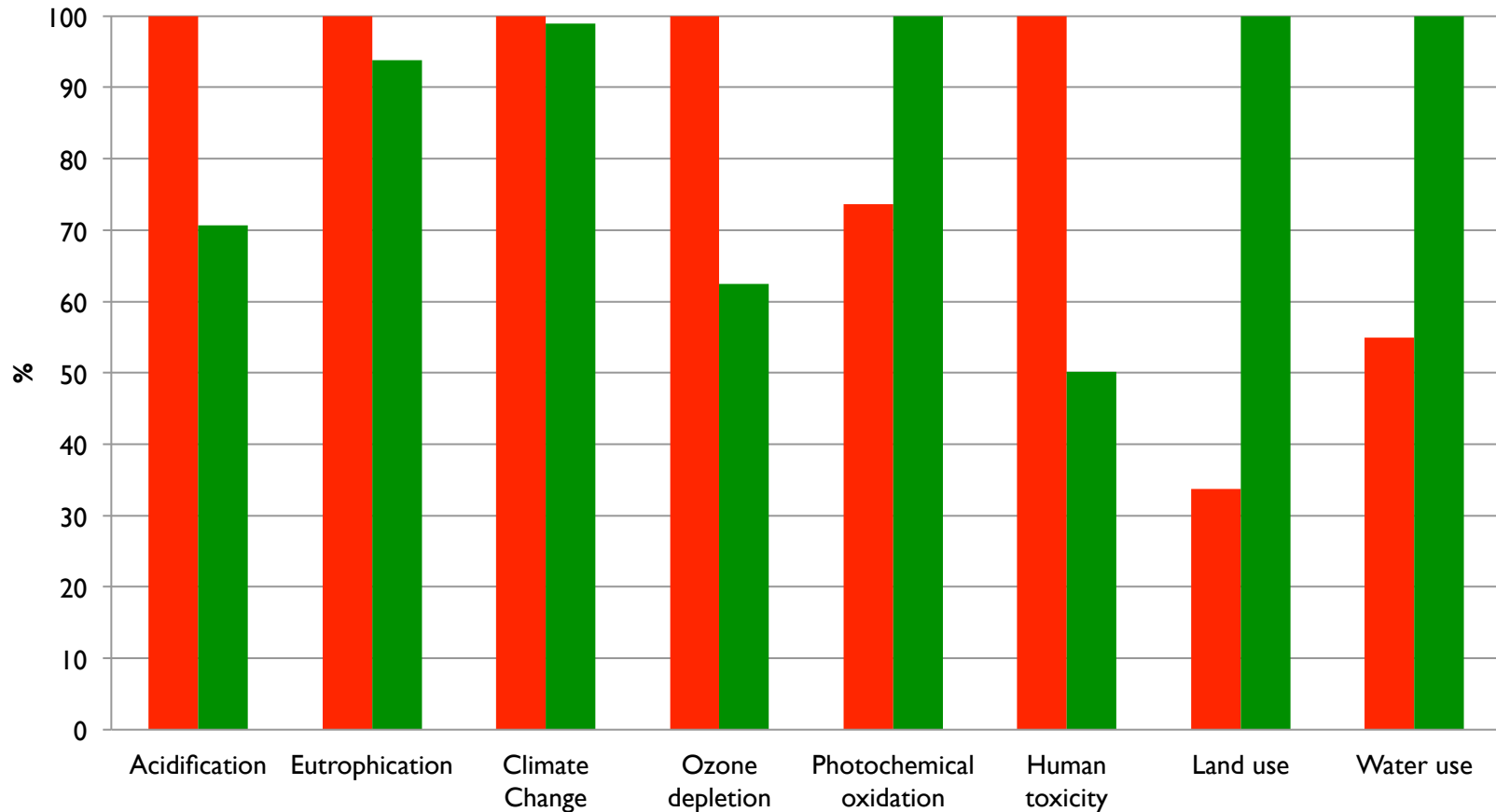
Intensiva: 74 m²

Tradicional: 220 m²

> IMPACT ON EXTENSIVE CHAIN:

- Less production/land unit
- Longer period of time to achieve final weight

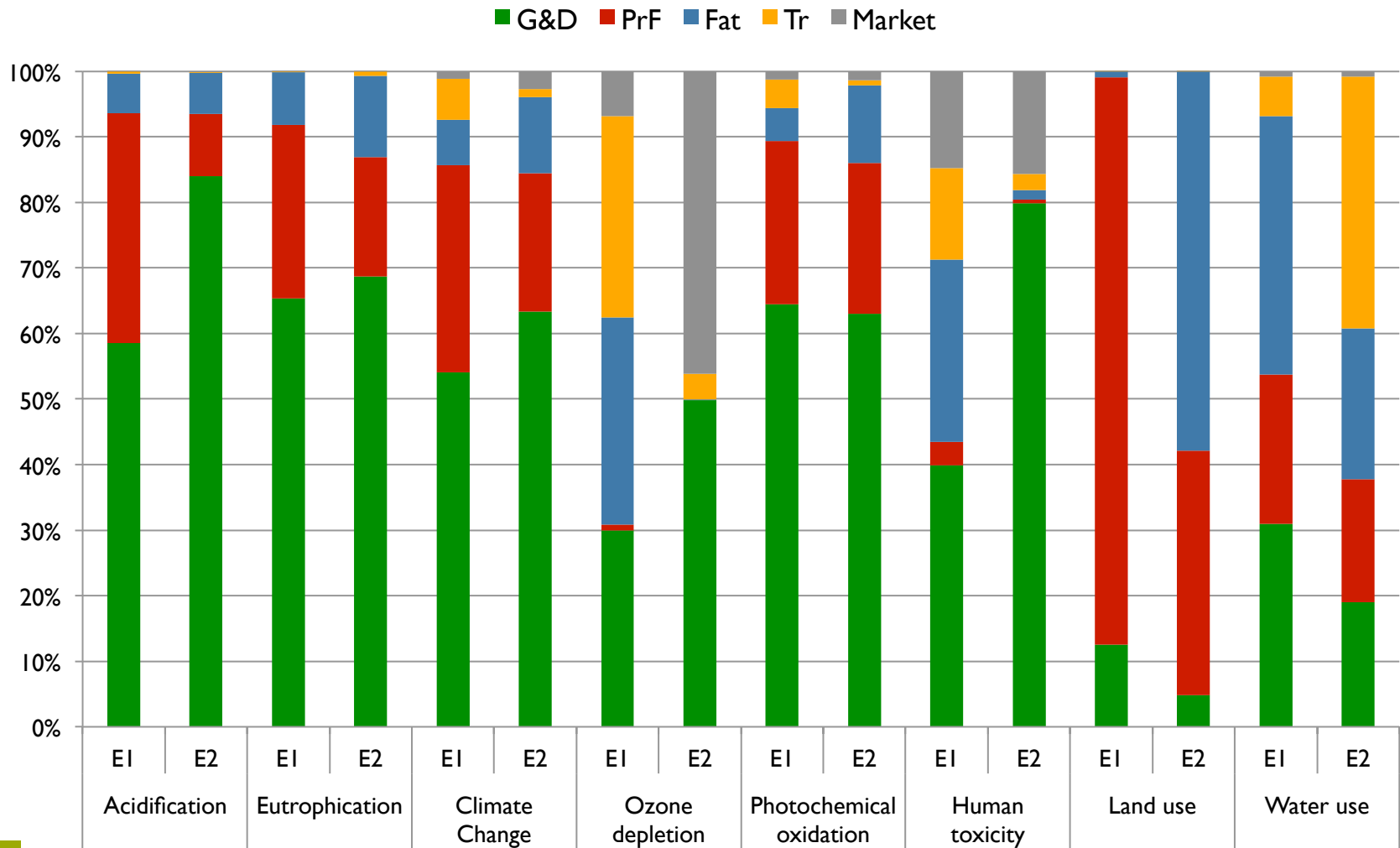
Results



■ Intensive

■ Extensive

Environmental impacts by process



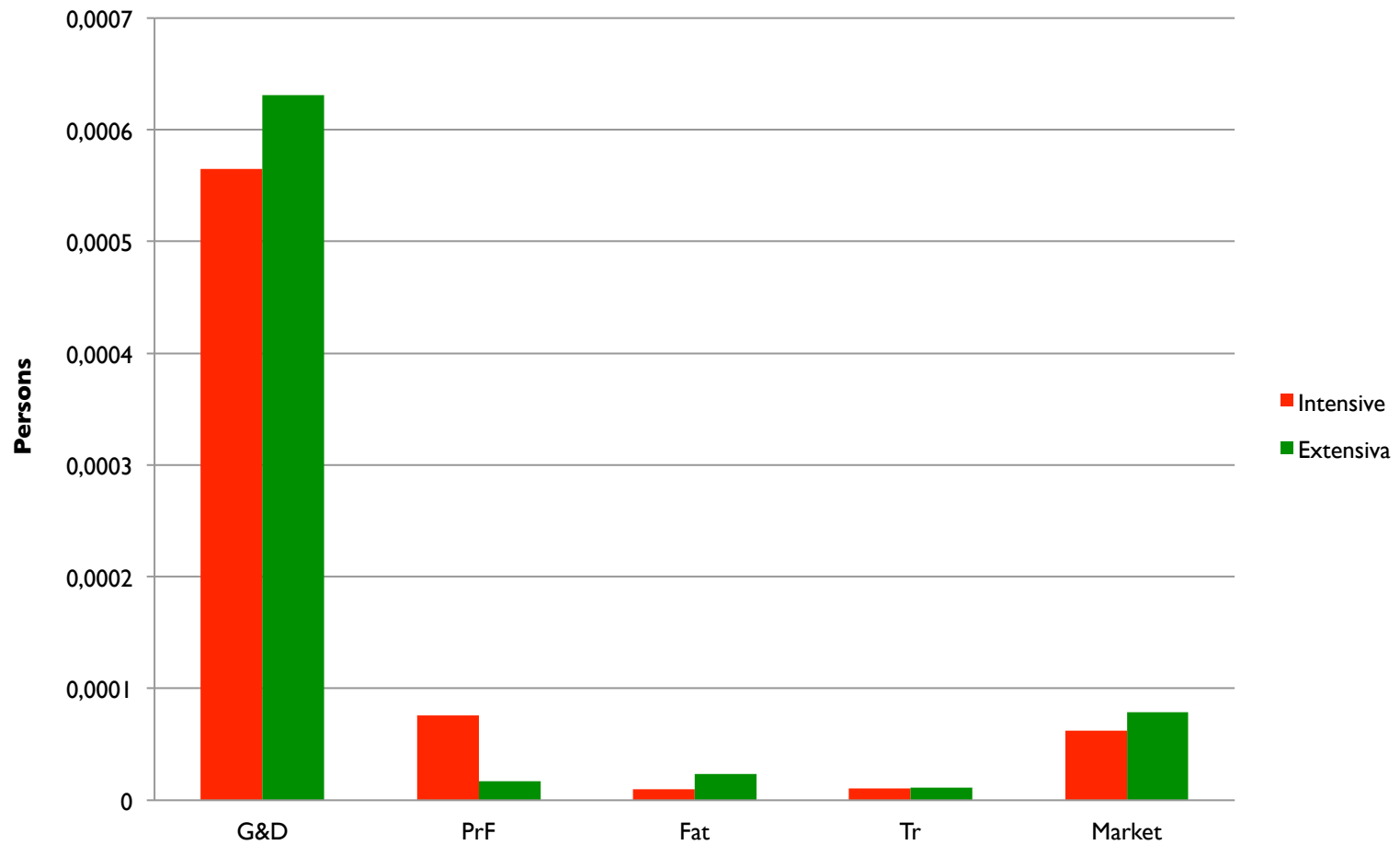
IDENTIFIED PROBLEMS

- INTENSIVE
 - Has greater impact in 5/8 categories due to the use of fertilizers, pesticides, and fossil fuel.
 - Packaging and marketing greatly contributes to human toxicity and climate change.
- EXTENSIVE
 - Methane emissions from enteric fermentation are superior
 - Use more water
 - The use of electricity is inefficient in the market
- **People are aware but lack of organization and training**

POSSIBLE SOLUTIONS

- INTENSIVE
 - Improve grain production systems to decrease foreign dependency (pesticides, fertilizers, transport)
 - Decrease packaging or increase use of low impact materials
- EXTENSIVE
 - Improve feed quality (legumes) to decrease Green gases
 - Improve Non-TIF processes to decrease water consumption
 - Trained personnel
 - Manure management (digesters or land use)
- **Importance of communicating chain actors the relevance of integration from the environmental point of view.**

Social Results-1



Social Results-2

- Intensive chain
 - 83% male
 - 17% women
 - 85% slaughterhouse
 - 11% animal production
- Extensive chain
 - 88% male
 - 12% women
 - 50% slaughterhouse
 - 50% animal production



Curso sobre mercado y sustentabilidad dirigido a los actores de la cadena cárnica mexicana



Gracias!!!!!!!!!!!!

