Life cycle assessment (LCA) of two beef production systems

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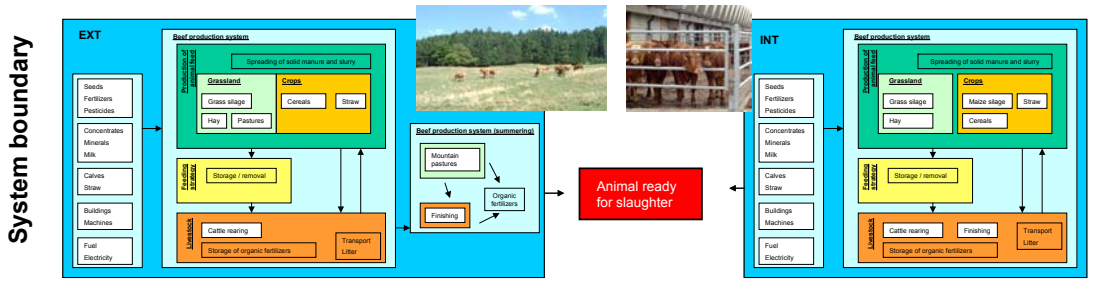
OBJECTIVE

Determination of the environmental impacts of two contrasting beef production systems by life cycle assessment (LCA).

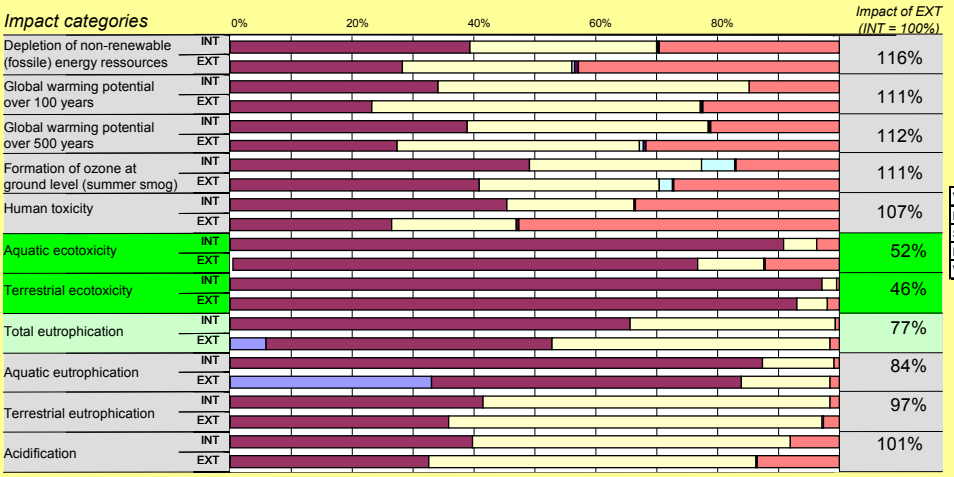
MATERIAL AND METHODS

An extensive fattening system of Limousine x Simmental crossbred steers based on grass (EXT) was compared to an intensive fattening system of Simmental bulls (INT). The animals of EXT and INT were slaughtered at 20 and 13 months of age, respectively.
EXT: two grazing periods, the second one on an unfertilised mountain meadow, at low stocking rate; winter ration: low-quality hay and grass silage (1:1).
INT: continuously fed indoor with a ration composed of grass, maize silages (1:2), and concentrates (soybean meal and barley, 1,5:1).
The production data were based on experiments. The environmental impacts were quantified by using the software TEAM™ and the Swiss Agricultural Life Cycle Assessment (SALCA) database.



RESULTS

Environmental impacts per kg of carcass of an extensive (EXT) compared to an intensive beef production system (INT)[a]



[a] Within a production system and an impact category, each factor is expressed as a percentage of the sum of all related factors

- The environmental impacts of EXT were similar or lower than those of INT
- The largest differences were found in **toxic effects on aquatic and terrestrial ecosystems**
- The **amount and type of fertilizers** used to produce the feed were the main source of difference between the systems

CONCLUSION

The extensive use of grasslands for beef production has the potential to reduce the environmental impacts per kg of carcass, especially if the animals reach desired slaughter maturity on the pasture (i.e. no intensive finishing period required).

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