Social Life Cycle Assessment: a methodology to evaluate sustainability of cereal uses in Wallonia
Cereals food and non-food uses: « 4F »

- Human food uses
- Animal feed uses
- Energy uses
- Material uses

Food, Feed, Fuel, Fibre
ALT-4-CER: which « F’s » of the « 4F » for Wallonia?

Key steps:

1. To draw the portrait of the Walloon cereals, and their current and future/potential uses

2. To define several scenarios 2030 acc. to current trends (B-a-U) and contrasting breaks

3. To develop environmental and socio-economic LCA methodologies fed with local data

4. To integrate environmental and socio-economic aspects through multi-criteria analysis with stakeholders

➢ To provide clues for most sustainable and pertinent uses of the cereal resources in Wallonia
Walloon cereals: 2010

- **FORAGE MAIZE whole plant** 2 654 kt
  - 98%
  - 2%

- **BIOGAS** 8 440 000 m³
  - 45%
  - 44%
  - 10%
  - 1%

- **ANIMAL FEED INDUSTRY** 504 kt
  - 3 316 kt
  - (180 kt transfo. in Wallonia)

- **RETURN to soil** 547 + 68 kt
  - 10%
  - 80%

- **ANIMAL LITTER** 547 kt
  - 10%

- **ANIMAL FEED** 2 601 + 68 kt

- **STRAW** 684 kt

- **CEREAL GRAINS** 1 578 kt
  - 14%

  - Self-consumption and losses
  - 17%

  - Export

- **Collected GRAINS** 1 357 kt

- **INTERNAL MARKET** 1 130 kt

- **ANIMAL FEED INDUSTRY**
  - Coproducts 183 400 kg
  - Bioethanol 432 000 m³

- **STARCH INDUSTRY** 501 kt
  - 1 400 + 2 700 kt

- **MILLING INDUSTRY** 117 kt
  - 1 523 kt

- **MALT INDUSTRY** 8 kt
  - 993 kt

- **AGRO-FOOD INDUSTRY**

- **BAKERIES**

- **BREWERIES**

- **CHEMISTRY**

- **ANIMAL FEED INDUSTRY**

**Key**

- **FOOD FEED FUEL FIBRE** Walloon Origin
  - *Belgian consumption* kt = 1000 tonnes
4 contrasted scenarios for potential future uses:

• Defined with stakeholders’ support;
• Based on current trends and contrasting breaks;
• Key hypotheses: climate change, political choices, population growth, animal products consumption, etc.

1. Business-as-Usual: current trends extrapolated from past 15 years
2. Strategic: environmental, economic and social optimization of current system
3. Localisation: development of new cereal conversion units in Wallonia + increased autonomy
4. Globalisation: massive export + focus on high added-value products (biorefinery, bio-based chemistry)
Scenarios 2030: Grains + straw + forage maize
→ Cover the 3 pillars of sustainable development

→ **Common objective:** evaluate environmental and socio-economic consequences of potential changes in the uses of Walloon cereals by 2030, in comparison with current situation (2010)
Scenarios analysis with E-LCA

Environmental LCA → identify regional differences regarding the cultivation step:
→ (New) cropping practices;
→ Machinery characteristics & fuel consumption;
→ Direct field emissions assessment;
→ Inputs management;
→ Animal feeding & husbandry;
→ etc…

+ Conversion processes based on existing facilities
Scenarios analysis with S-LCA

- **Stakeholders categories**
  - Workers
  - Companies
  - Farmers

- **Impact subcategories**
  - Workings hours
  - Health and safety at work
  - Local employment
  - Added value creation

- **Impact categories**
  - Working conditions
  - Socio-economic repercussions
Data inventory in S-LCA

- **Working conditions: interviews:**
  - Using methodology *Bilan Travail* (production step):
    - Developed by INRA in order to assess *work types* and *share* for animal rearing systems
    - To be adapted for crop systems

- **Use farms’ accounting data** collected at the Walloon Region level (FADN-like) (production step)

- **Conversion step:** data collection from existing facilities
Multi-criteria Analysis

• **Integrate** environmental and socio-economic impacts (E-LCA & S-LCA results)

• **Involve stakeholders** (producers, policy makers, consumers):
  
  – **Identify** most relevant impact categories, **group/prioritize**
  
  – **(Weight into a global performance indicator?)**
ALT-4-CER: Expected results

Key features of the project:

• To involve local stakeholders in all steps (scenario building, data collection, impact weighting)
• To use local data for local issues

Answer key questions raised today in human Societies:

“What type of agriculture do we want for tomorrow? Is it ethically, environmentally and economically sustainable to dedicate cereals resources to other uses than human food?”
Thank you for your attention!

Contact:
Alice DELCOUR, Florence VAN STAPPEN
Walloon Agricultural Research Centre
a.delcour@cra.wallonie.be, vanstappen@cra.wallonie.be