

**Cosun: Simple animal feed production techniques from sugar beet leaves *by increasing its dry solid content.***

**Problem description**

Cosun excels at creating value from crops and has a wide range of food products, among them animal feed. In the fabrication process of products from sugar beets, biological waste is generated. An unused waste stream is the leaves of sugar beets that are currently left on the land. In the context of sustainability and new product development, Cosun is examining how sugar beet leaves can be used for making animal feed. The current animal feed is made from soybeans which have high nutritional value. Therefore, to become a viable replacement raw material, the nutritional value of the sugar beets leaves have to be increased. Cosun is aware of drying techniques, but these require too much energy to create a viable product from sugar beets. The primary challenge is to reduce the water content in the sugar beet leaves such that; it can be ensiled, to prevent decay of the leaves and increase the nutrition content. An improvement of the current drying techniques is also of interest if it would meet the requirements of the challenge.

**Current known technique(s)**

Mechanical separation techniques: screw press, filter press, centrifuges, vacuum drum filter, Bucher press, and filters.

- Thermal concentration techniques: multi-effect drying, mechanical vapour recompression, and thermal vapour recompression
- Drying techniques: spray dryer, fluid bed, dryer, drum dryer, belt dryer, IR dryer, adsorption, crystallisation, distillation.
- Membrane technology: microfiltration, ultrafiltration, nanofiltration, and reverse osmosis
- Other possible solution directions: ensiling (like grass, requiring dry solid content >20%), a mobile mechanical press to use onsite, a system to create and dry pulp from the leaves.

### Objective(s) - should have

**General objective: increase the dry weight content of the sugar beet leaves from 12% to at least 20%.**

- The system needs to be simple, mobile & flexible to allow onsite application (farm)
- The system needs to be cost-effective (e.g. animal feed made from soybeans **as well as beetpulp** sell at a price of €150/Ton)
- The system can be applied in the short term to conserve the fresh product.
- The system enables long-term conservation of the product (> 6 months)
- The system does not increase emissions (like N<sub>2</sub>O, CO<sub>2</sub>)

### Constraints - must have

- The output product needs to be edible/digestible by animals
- Nutrients such as proteins, sugars and fibres and minerals need to remain intact. The nutritional value measured in VEM
- No use of harmful chemicals