

# Ensiling legume forage pulp

## Problem

Pulp is a co-stream in the extraction of protein from forages in a screw press. Pulp may be a valuable feed for ruminants, but low sugar content is a challenge for the ensiling process. However, it is still a valuable feed that can be preserved as silage and utilised for ruminant feeding. The juice extraction also lowers the sugar content making the pulp less suitable for ensiling.

## Solution

The addition of sugars as molasses at the dose of 50 kg/ton of fresh pulp stimulates lactic acid fermentation, resulting in successful preservation and good stability at feed out, when best-practice ensiling rules are respected. Alternatively, add dry feeds like sugar beet pulp or a cereal meal at 150 kg/ton of fresh pulp.

## Impact

The knowledge obtained in ProRefine will support the implementation of biorefined forage legumes as high-quality protein sources in the European organic sector and give value to the fibrous co-products. This will contribute to strengthening the agricultural sector in Europe, while also improving the cooperative utilisation of local resources.

## Practical recommendation

- **Harvest the forage legume before flowering.**
- **Fractionate the plant into a green juice and a fibrous pulp using a screw press.**
- **Ensile the pulp as soon as possible, adding molasses or, if your pulp contains less than 30% dry matter, mixing with dry beet pulp or a cereal meal and following the general rules for ensiling.**
- **Wait at least 40 days before opening the silo.**

## Applicability box

### Theme

Feed production

### Keywords

Animal production, biorefinery, sustainability, self-sufficiency

### Geographical coverage

Countries relying on imported feed protein

### Required time

Can be applied immediately, but method is continuing to develop

### Period of impact

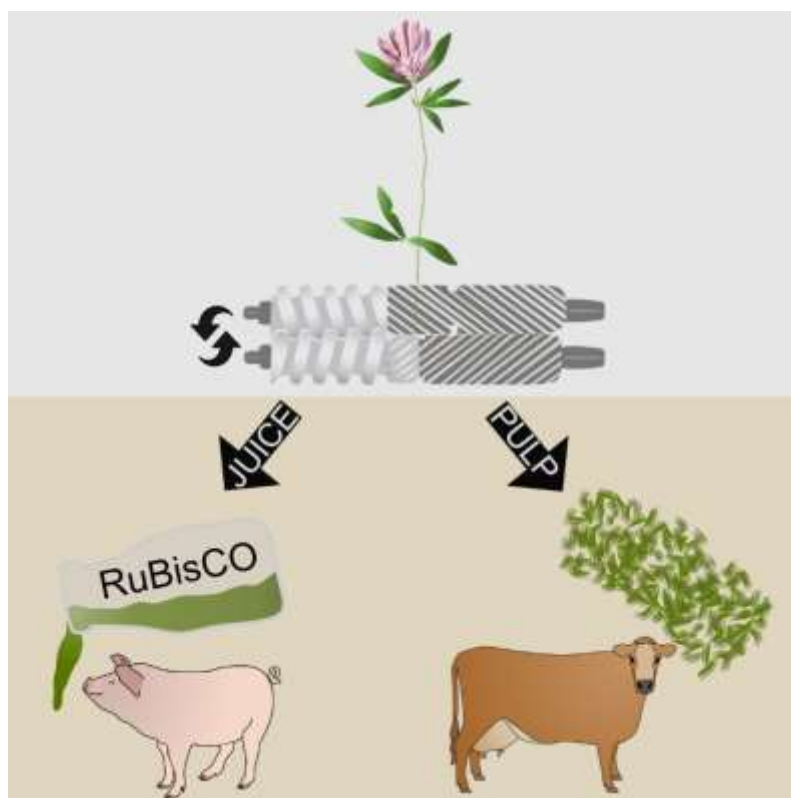
Continuous

### Equipment

Screw-press, heat system, decanter, equipment for drying



Photos: Experimental field with lucerne (left) and juice and pulp (right)



**Illustration: Protein concentrate from green juice of biorefined forage legumes is rich in RuBisCO-protein and a valuable feed in pig production.**

**Biorefined lucerne pulp silage is well accepted by bovines, sheep, and goats and, when included in well balanced diets, supports milk yield and growing performance.**

**The pulp is rich in digestible fibre and represents a valuable feed for ruminants (© Brooke Micke, SLU).**

### Further information

#### Weblinks

Check the [Organic Farm Knowledge Platform](#) for more practical recommendations.

### About this practice abstract and ProRefine

**Publisher:** Università Cattolica del Sacro Cuore - Department of Animal Science, Food and Nutrition – DIANA, Italy

**Authors:** Paolo Bani

**Contact person:** Paolo Bani

**Permalink:** <https://orgprints.org/43873/>

**ProRefine:** This practice abstract was elaborated in the ProRefine project. The project was running from May 2018 to November 2021. This transnational project was funded via the ERA-net CORE Organic Cofund based on funds from participating countries and funding from the European Union and Conseil Régional des Pays de la Loire.

**Project website:** <http://projects.au.dk/coreorganiccofund/research-projects/prorefine/>

**Project partners:** Norwegian Institute of Bioeconomy Research, Università Cattolica del Sacro Cuore (Italy), International Agricultural Research and Training Center (Turkey), Trust'ing – Alf'ing (France), Ruralis - Institute for Rural and Regional Research (Norway), Swedish University of Agricultural Sciences (Sweden), Institut National de la Recherche Agronomique (France), Aarhus University (Denmark).

© 2021

