

# Protein from sugar beet leaves: harvest, extraction and applications

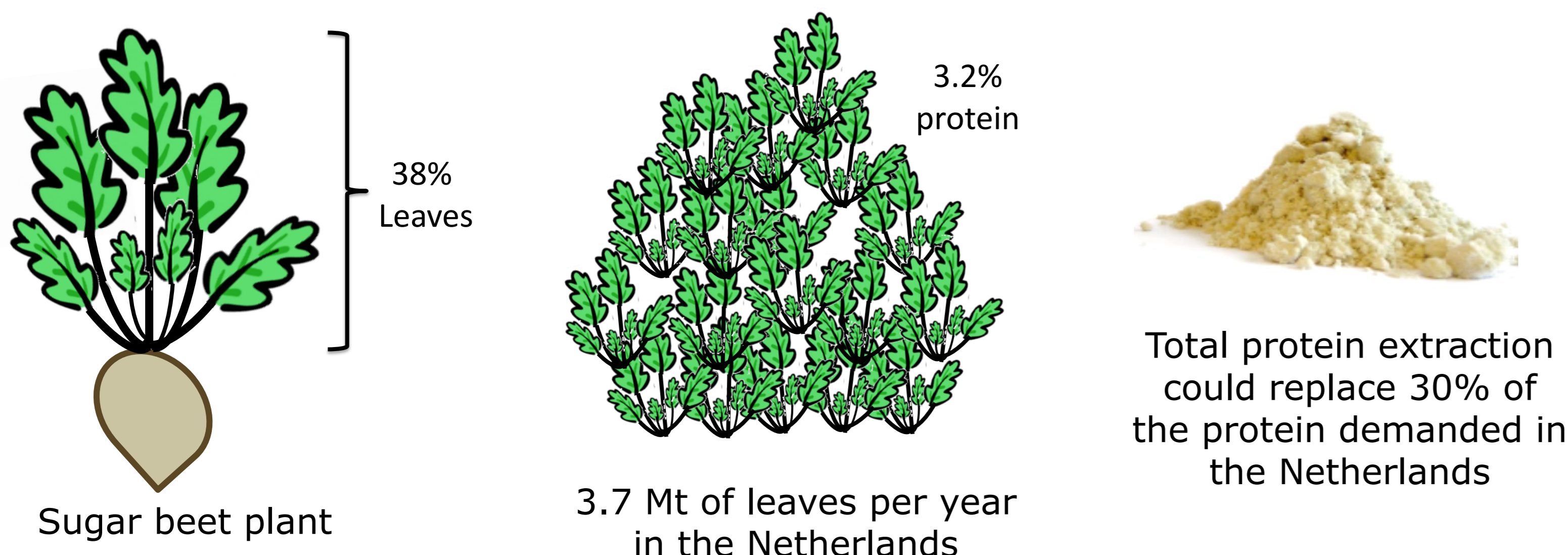
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## Introduction

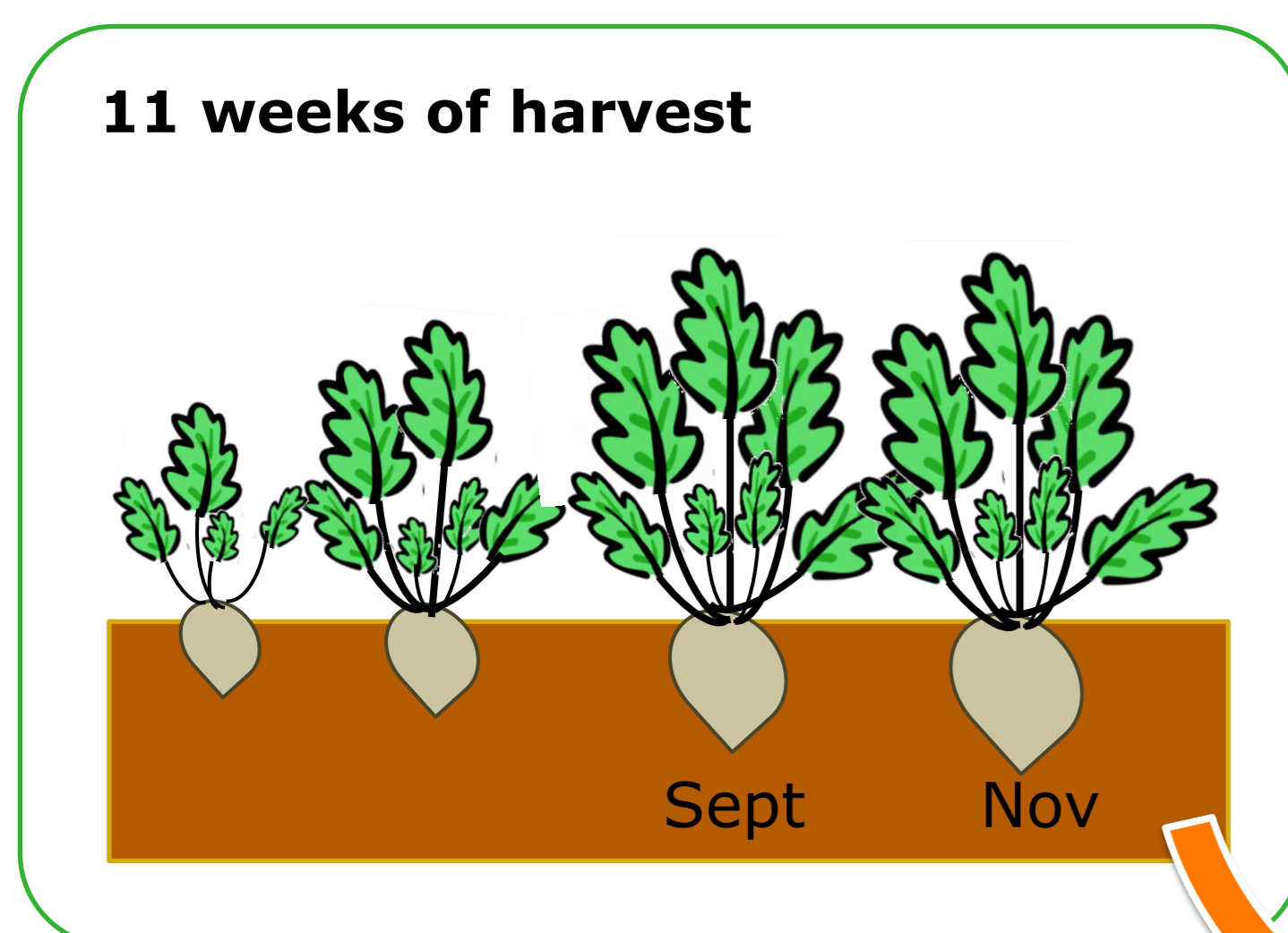
Sugar beet leaves (SBL) have been recognized as a promising new protein source [2]. Till now, focus is on soluble proteins, mainly rubisco (ribulose biphosphate carboxylase/oxygenase), while the insoluble proteins (green fraction) are neglected. In the Netherlands, sugar beet is the fourth most produced crop with an average production of 6.1 Mt per year [1]. This also means about 3.7 Mt of leaves per year that can be used for protein extraction.

One of the big challenges for the protein extraction is the fact that sugar beet leaves have a high water content and are harvested in a short period. The initial processing steps are therefore crucial to obtain stable material for further protein extraction and to give added value to this waste-stream.



## Objectives

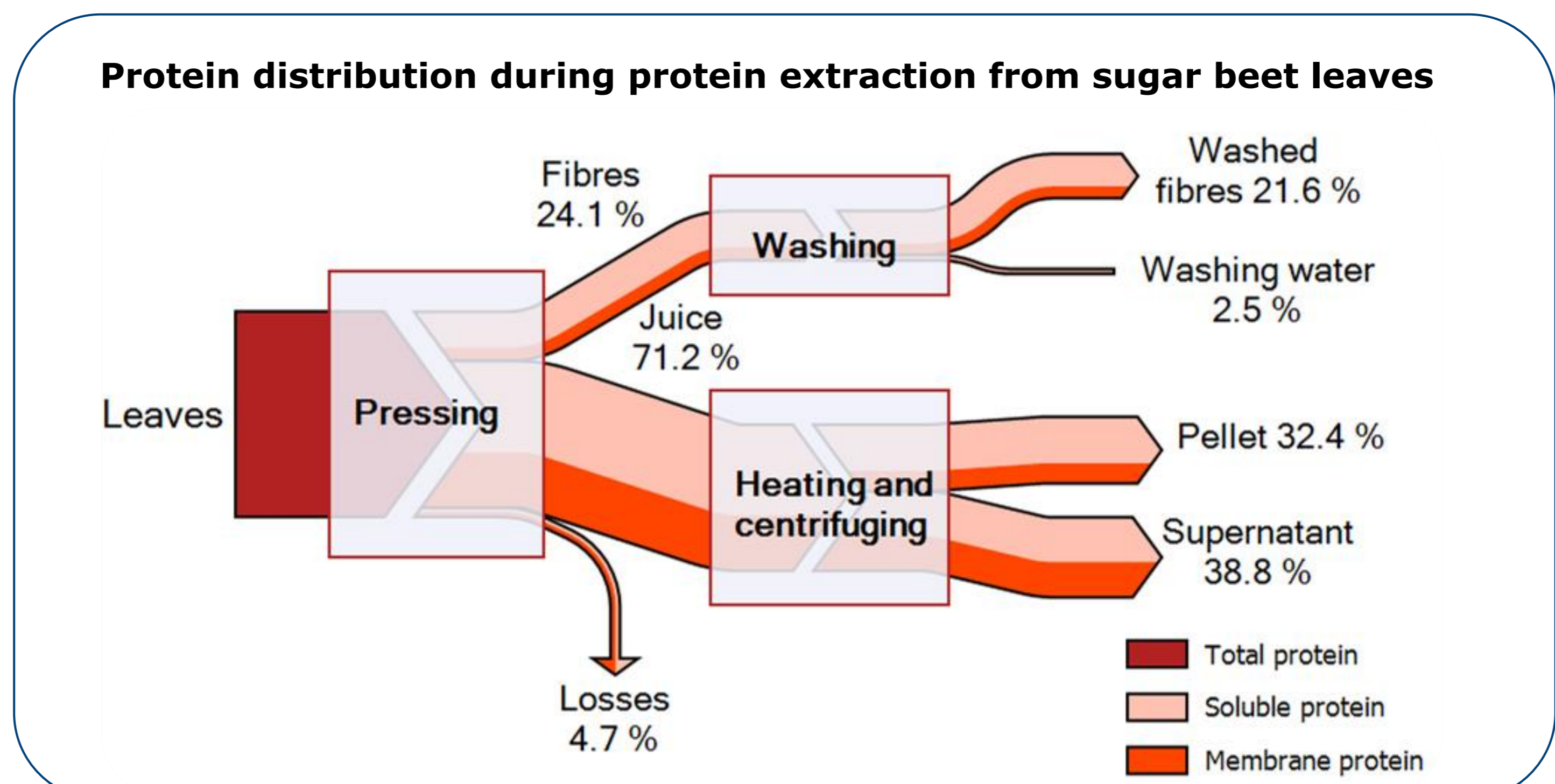
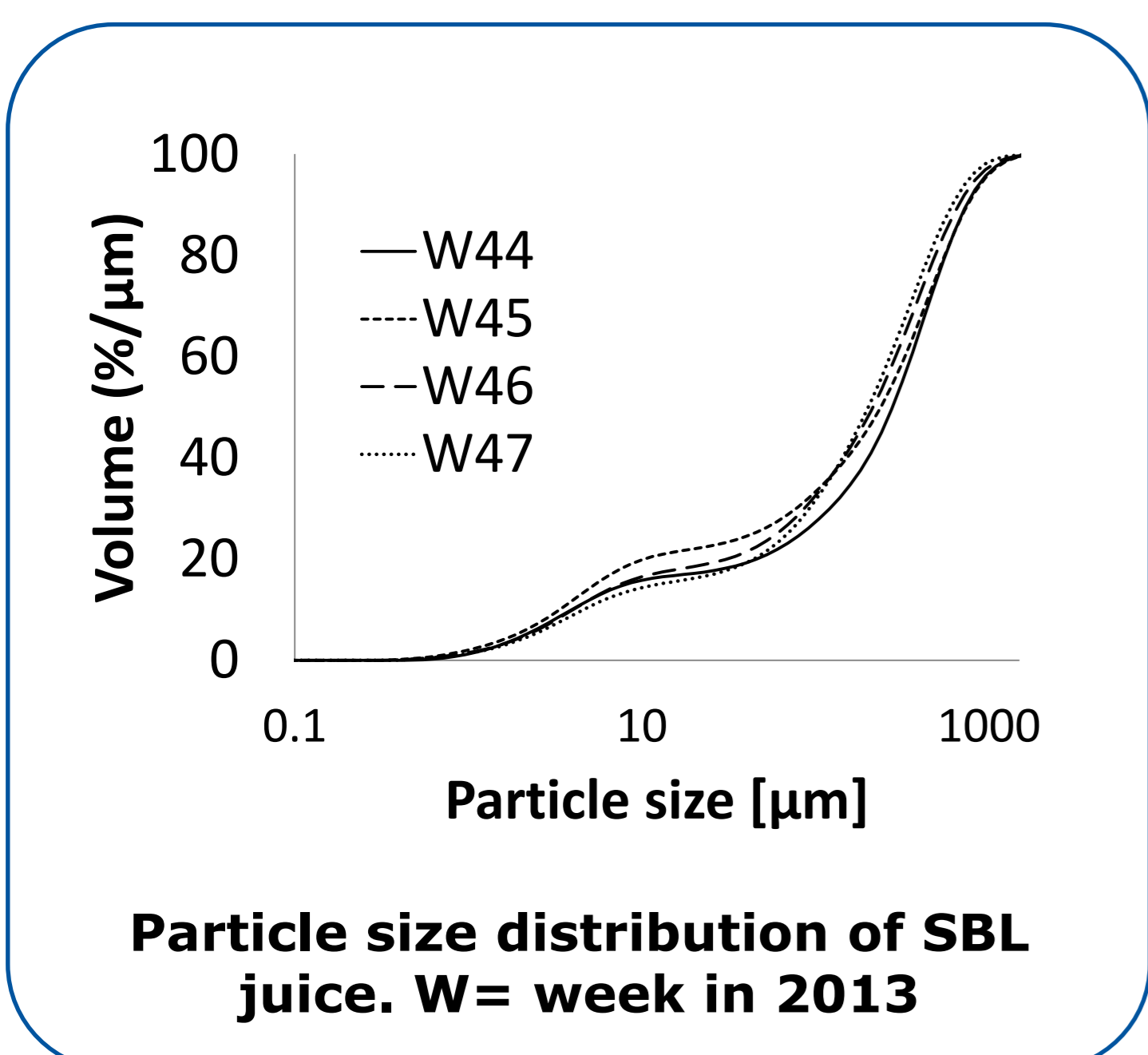
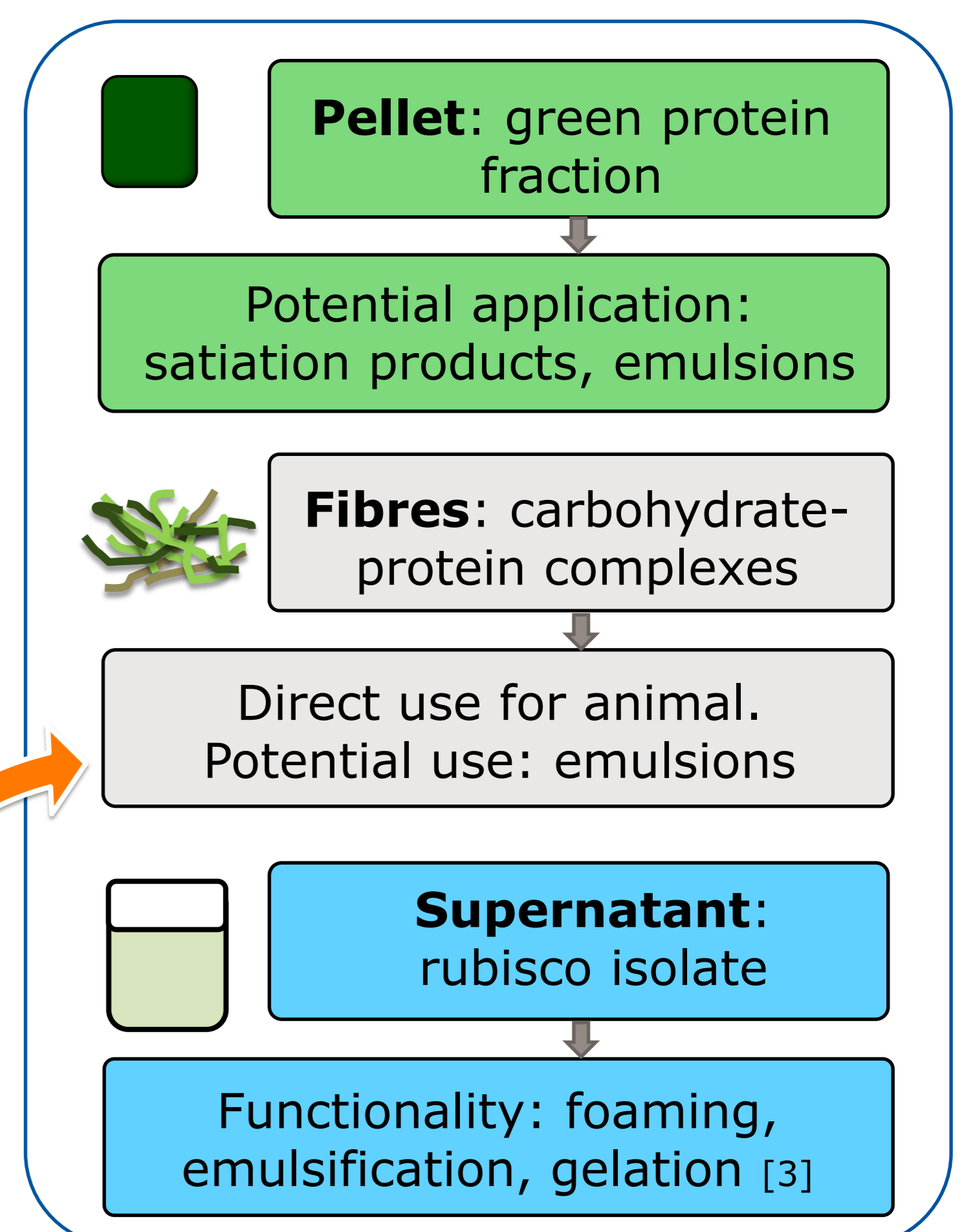
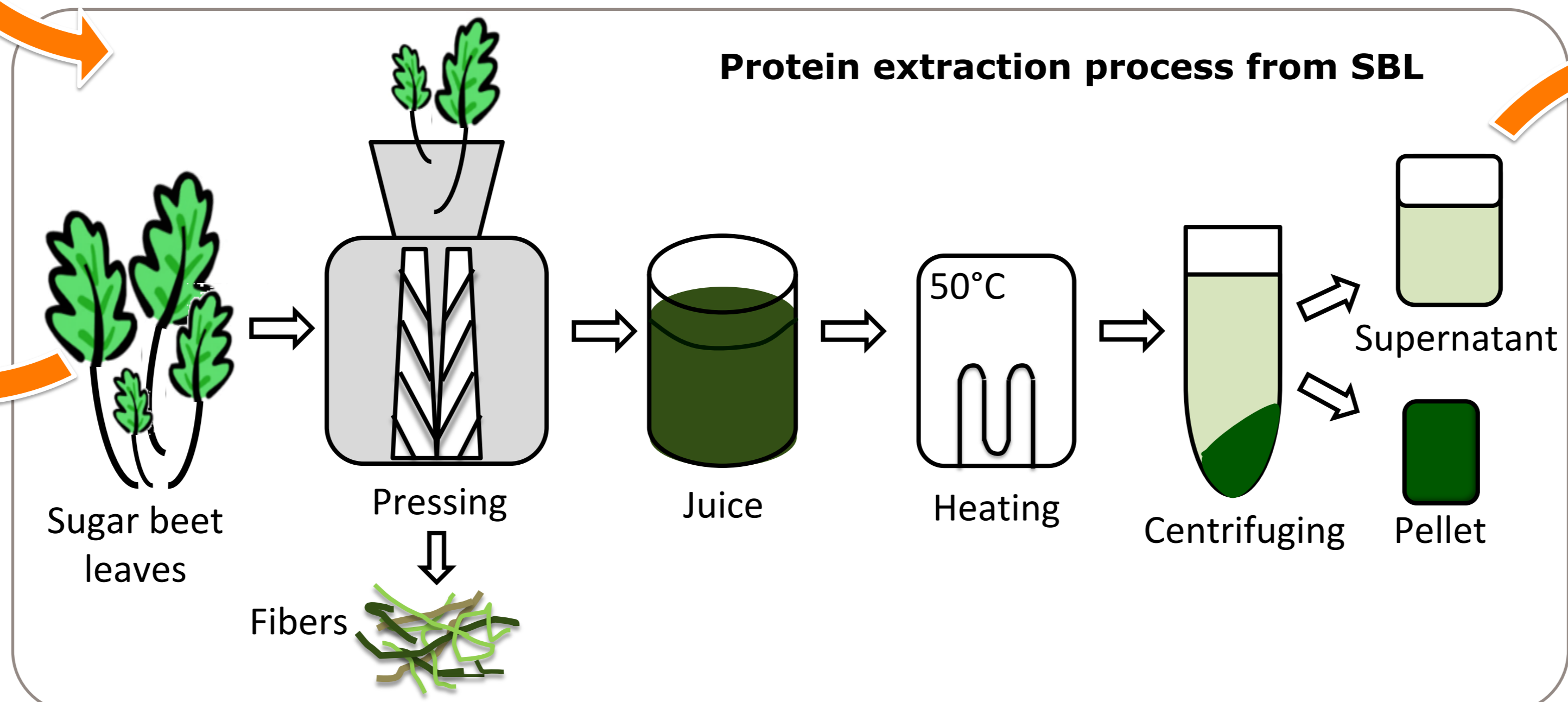
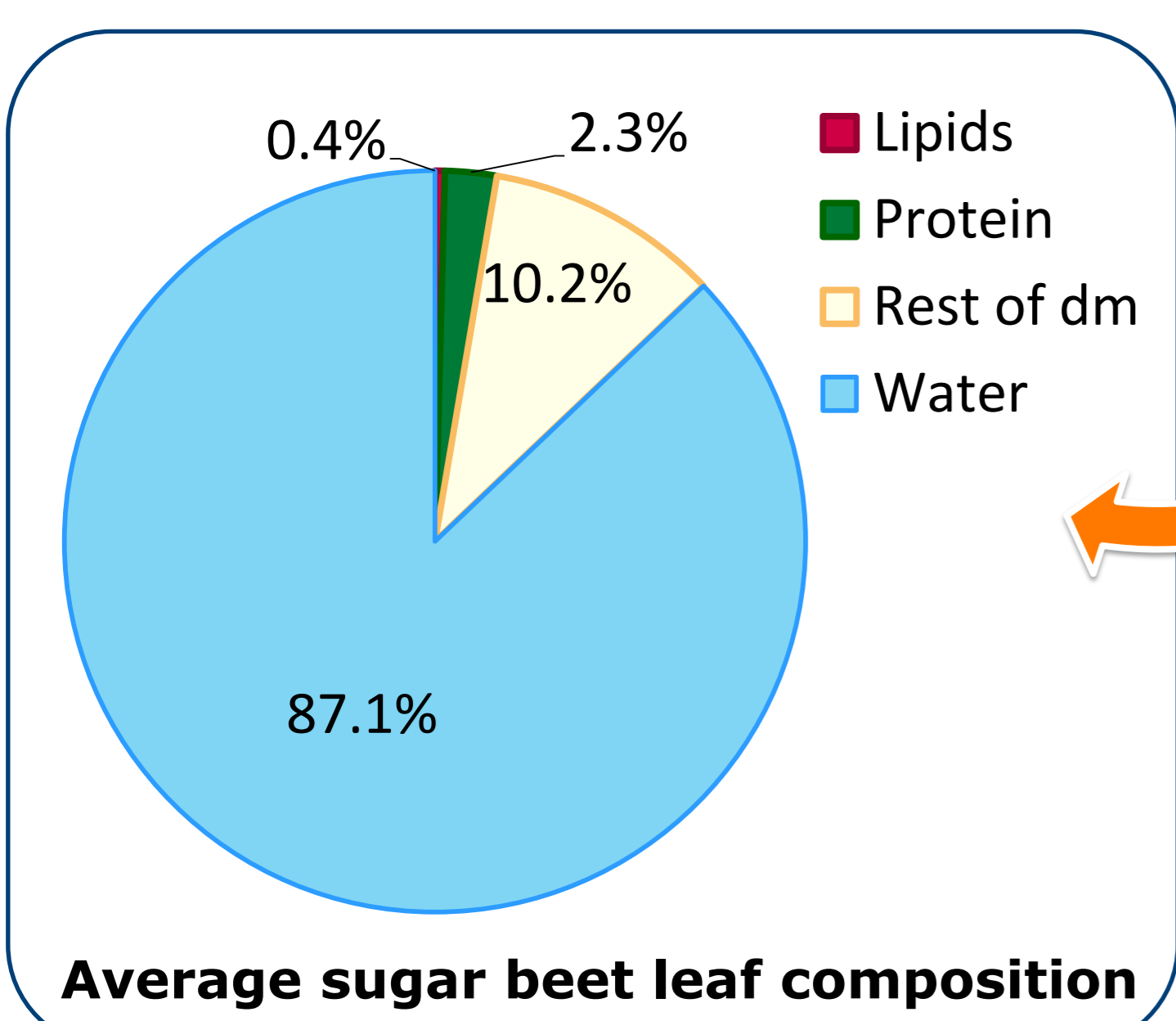
- To analyse the compositional variation of sugar beet leaves during the harvesting time, focusing on the stability of the leaf material and the protein content.
- To develop an extraction method to obtain un-refined green protein fraction from leaves, analysing the stability over time of and the protein distribution along the process.



## Methods and Results

Leaves harvested during 11 weeks were pressed to obtain a clear juice, while separating the fibers. The juice was heated to 50°C for 30 min and then centrifuged at 15000 g for 30 min. The resulting supernatant and pellet were separated and the composition (i.e. dry matter, lipid and protein content) was analysed.

Samples of leaves and leaf products were stored at -25°C. Particle size distribution in juice samples was analysed by laser light diffraction. Potential applications for each fraction are described.



## Conclusions

- There is flexibility on leaf harvest but limited time to process large amounts of leaves due to the high water content.
- The protein content and physical properties of sugar beet leaves products are stable over the time and after freezing.
- About 70% of the protein is collected within supernatant and pellet. Further processing and application of these fractions are being study.

## Acknowledgements

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## References

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