Green protein without taste of cowshed

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Credit: Miriam Meister

Researchers from DTU Food have developed a technique for extracting protein from green biomass without unwanted off-flavor.

Cows like grass to taste like grass. However, if people are to eat sustainable protein extracted from green biomass such as ryegrass and alfalfa, it is crucial that it does not have a taste profile which some people describe as 'cowshed."

Food producers can use aromatic ingredients to camouflage the protein

powder's off-flavor, or they can use techniques to remove it from the powder.

In fact, researchers in this field describe the removal of the unwanted taste as "The Holy Grail." Nonetheless, it seems that DTU Food may have found it: DTU Food's researchers have succeeded in removing most of the hay smell and cowshed taste by using a supercritical CO_2 extraction system to treat protein mass made from alfalfa.

A supercritical CO_2 system works by bringing CO_2 into a supercritical phase by increasing the gas to above 70 bar pressure and above 33 degrees Celsius. In this phase, CO_2 constantly switches between being in the gas phase and the liquid phase. This enables the gas to penetrate particles—such as the green protein—and extract flavors and aromas from the protein without altering its functional properties.

Replaces soy protein

The technique is actually not new. It has been used safely for more than half a century to remove, for example, caffeine from coffee and aromatics from hops. Once the protein from the green biomass has been treated, it can be used in foods and replace the soy proteins that have been the primary source until now. Swapping the protein sources reduces the climate impact of the foods.

Until now, DTU Food has only had a small-scale supercritical CO_2 plant at its disposal, which the researchers have used to experiment with finding the exact settings needed to make the power neutral in terms of taste and fragrance.

With funding from the research infrastructure FOODHAY, DTU Food has now purchased a larger plant that can handle much greater amounts of protein powder. DTU Food sends the treated powder to its project

partners, which incorporate it into various food products with a lower climate footprint.

Provided by Technical University of Denmark