


DIVINFOOD

 Co-constructing interactive short and mid-tier food chains
 to value agrobiodiversity in healthy plant-based FOOD

DIVINFOOD Community in Practice Webinar on Legume and Cereals Fermentation

Summary

The Vegetarian Society of Denmark (DVF) organised a webinar under the DIVINFOOD project Community in Practice, focusing on how fermenting legumes and cereals can promote the use of neglected and underutilised crops (NUCs) and support the transition to more plant-based diets. Three speakers were invited to share their experiences with fermentation.

Introduction

Wild and cultivated biodiversity is in rapid decline due to land use changes from agricultural industrialisation, the expansion of meat- and sugar-heavy food systems, and climate change. NUCs offer a solution to mitigate this decline by potentially creating new markets and enhancing the nutritional value of traditional products, thus diversifying diets.

There is growing consumer demand in Europe for local, minimally processed, nutritious plant-based foods. However, links between minor cereals or legumes and appealing, healthy food products are lacking, and high-quality plant-based products from NUCs are not yet well-established in markets.

The main goal of the multi-actor, participatory, DIVINFOOD project is to promote the use of NUCs in food chains to support healthier diets and more sustainable food systems. To support this, the project has established a Community in Practice focused on minimal or mild processing of NUCs, supported by a webinar series that was launched with a session on fermenting legumes and cereals.

Practical recommendations

During the webinar on the fermentation of legumes and cereals, three speakers were invited to share their experience with fermentation. The speakers were: 1) Mac Król, Founder of Nordic Koji Company (Denmark) producing miso, shoyu and other fermented products from legumes and grains and President of the European Miso Institute (International NGO); 2) Carlo Nesler, Founder of Nesler – Cibo Vivo (Italy) a company producing fermented condiments and other foods from legumes and cereals; and 3) Dennis S. Nielsen, Professor at the University of Copenhagen, and PROFERMENT project leader (Denmark). The vision of the PROFERMENT project is to build the scientific foundation for future development of a new category of proteinaceous, plant-based foods as clean-label alternatives for meat consumption. Using solid-state fermentation, the proteins in legumes and cereals will be nutritionally optimised and appealing structures and flavours created.

The main conclusions from the speakers were:

-Fermentation of legumes and cereals have many different applications and uses. From a culinary perspective, fermentation of legumes and cereals are used for condiments (e.g. gochujang chili paste), to flavour ingredients and dishes (miso, soy sauce etc.) and in pantry items. Fermentation for direct consumption is widely used in the production of alcohol, snacks (e.g. tempeh snacks) and fermented grain dishes.

-Fermentation of legumes and grains taps into current trends e.g., upcycling for food waste reduction. The Danish beer brewing company BRØL is an example, whereby it turns surplus bread into beer using fermentation. Another example of upcycling ingredients with fermentation is coffee ground shoyu (Japanese soy sauce) or stale bread soy sauce (amino sauces).

-Fermentation also taps into current trends in relation to the transition to plant-based diets. Several Danish start-ups are working with meat substitutes through fermentation of different legumes and cereals. The Matr company makes minced “meat” through fungal fermentation of oats, peas and lupins that are shaped into patties. The

companies Contempehrary and Tæmpeh make tempeh as a meat substitute made from fermented Nordic fava beans, peas and lupins, respectively.



Benefits and limits

Which value does fermentation add to legumes and cereals?

With fermentation we can increase the nutritiousness of our food. The microorganisms that are used in fermentation add nutrients to the final product, but also transform nutrients that are not digestible for us, into digestible ones. Fermentation is also a way of reducing the content of toxins or antinutrients in the products. In Africa, for example, fermenting Baobab seeds, which are inedible in their natural state, unlocks their 22 grams of protein per 100 grams of seeds. This process also produces the condiment Maari, enhancing the umami flavour and improving the amino acid profile with more of the essential amino acids.

Fermentation of legumes and cereals also brings value for gastronomy. Fermented products can enhance different cuisines in a positive way. Hence, many restaurants and kitchens are starting to use different types of fermented products (e.g., condiments and flavour enhancers) in their recipes.

A third aspect to value within fermentation of legumes and cereals, is the monetary value fermentation can add to rare varieties. Fermenting them into products like miso or shoyu can increase their market value and raise awareness of these lesser-known rare varieties. However, smaller companies face challenges such as higher pricing compared to large producers and supply chain instability, which affect their ability to meet consumer demand and build trust in their products.

While fermentation offers great potential for promoting legumes and cereals NUCs, there are some barriers and challenges to address. Consumer education on the use of fermented products needs to be expanded, as many people are unaware of how to incorporate these products into their diets beyond traditional uses, like miso soup. This lack of knowledge slows the transition to more plant-based diets. To overcome this, a stronger focus on educating consumers about the diverse uses of fermented legumes and cereals, along with their agricultural and health benefits, is essential.

Further information

Weblinks

Nordic Koji Company presentation: <https://nordickoji.co/>

Nesler - Cibo Vivo presentation: https://www.nesler.it/en_GB

Proferment project: https://food.ku.dk/english/research_at_food/research-projects/2022/solid-state-fermentations-for-protein-transformations-and-palatability-of-plant-based-foods-proferment/

About this practice abstract and DIVINFOOD

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DIVINFOOD - Co-constructing interactive short and mid-tier food chains to value agrobioDiversity IN healthy plant-based FOOD, is running **from March 2022 to Feb 2027**.

The overall goal of DIVINFOOD (a multi-actor, participatory project) is to facilitate the use and increase the value of Neglected and Underutilised Crops (NUCs) in food chains to foster healthier diets and more sustainable food systems.

Project website: www.divinfood.eu

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