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## Notes from workshop on oats for oat drink 30 November 2022



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## Background and participants

A workshop on oats for oat drink was held on 30 November 2022, more specifically which quality parameters are important in oats for the production of oat drink, so that it is possible to make cultivation measures to optimize the right quality as well as a breeding effort targeted at oat drink. The industry was widely represented, and experiences and challenges were shared between producers, millers, breeders and researchers. This document contains a summary of the most important points that were expressed during the workshop.

## Cultivation of organic oats

At the outset, Lars Egelund Olsen from the Innovation Center for Organic Farming presented trial results and data which substantiate that oats are a healthy, competitive and nutrient-efficient crop that is particularly suitable for organic crop rotation, and that it has a number of potential health-promoting effects in human nutrition, and that there is the possibility of gluten-free production. See presentation from the workshop.

## Raw material

Oat drink is often made from a base/syrup - and large differences are reported in this base, which is why it could be interesting to start here by investigating which properties are important in such a base. The starting point for the base – e.g. which variety/varieties have been used, is typically not known.

## Need for a baseline

There is a need to create a baseline, and map the variability found in the available varieties, protein and amino acid composition, starch content, color etc. There is also a need for an effort to identify which proteins, such as avenin, that are important for various oat drink products.

## Parallels to malt brewing and groats

The process for making oat drink has certain parallels to brewing, and it was suggested that it could be interesting to include some of the tests from EBC mashing, which are used to qualify malt barley varieties for beer brewing, and create a test protocol with relevant quality parameters in relation to oat drink, once the desired quality parameters have been characterized, and test oat varieties according to the test protocol.

It was mentioned that large kernels and uniform kernel size in relation to use as groats are an advantage, and this can potentially also apply to oat drink.

## Variation in types of oat drink

It is an advantage for producers that oats have a familiar taste. The drink is sweeter than milk. There are various mixed products on the market, some manufacturers add, for example, pea protein, which might not be necessary with the right oat variety. There is a greater variation within oat drink than what is available in Denmark. There is, for example, oat drink in Sweden and England, which has a thicker consistency and a different taste. A producer of oat drink from England also participated in the workshop.

## The manufacturing process and ingredients

It is important that an oat product contains a certain level of betaglucan, so that the product can be praised for its health effect in that respect, but there is a challenge with the viscosity of e.g. oat drink with larger amounts of betaglucan. For yogurt-like products it is more advantageous in terms of viscosity, but in the thinner oat drink it presents challenges.

It was mentioned that the milk protein casein is very similar to gliadin in wheat and that wheat can be an interesting ingredient in oat drink to achieve milk-like properties.

All in all, the processing of proteins and carbohydrates in the manufacturing process is where the answers should be found in the coming time. It remains to be investigated which fractions are useful and non-useful. There is a need for a characterization of proteins in relation to functionality. Plant protein behaves very differently from animal protein. Later, knowledge about the proteins' solubility, gelling properties, cross-linking etc. will also be needed.

Knowledge of enzymatic treatment, filtration techniques, extraction, enrichment, microbial treatment is also needed, but first you need to know how the proteins behave.

It is also in the manufacturing process that we must find answers to which parameters are important in varieties of oats for oat drink. Only then can specific breeding targets be set. There is an expectation that different varieties will give differences in process, but we are not there yet.

Tests are carried out at the producers of oat drink - but they don't necessarily know why it works when it does.

## Health

In addition to questions related to the processing and constituents, there is also a need to investigate how the health-promoting constituents in oats can best be preserved in the drink without affecting viscosity etc.

There are permitted health claims in relation to beta-glycans and dietary fiber from oats at a min. content and intake. Betaglycans are non-digestible polysaccharides and are classified as water-soluble dietary fibres, which can be claimed to maintain normal blood cholesterol levels and, when consumed as part of a meal, to help reduce post-meal increases in blood sugar levels. Varietal differences have been found in the content of betaglycan. In addition, oats also contain other possible health-promoting ingredients such as avantramides, lignans, sterols, phenolic acids, etc.

## Breeding goals

Due to the breadth of types of oat drink and other oat-based milk replacement products, it is a challenge to set specific breeding targets, unless large parts of the industry can agree on which product is ultimately desired.

This is a very young industry, and there is not necessarily definitive knowledge or consensus about which parameters are most important in breeding and which varietal characteristics you are looking for. But there is a consensus that much more research needs to be done on protein handling in relation to process, viscosity etc.

## Perspectives

The producers of oat drink expressed an interest in continuously creating renewal and new products, preferably from locally grown oats. However, development is several years behind milk, which means that there is a great need for new knowledge and development in the area.

In Sweden, a major investment has been made in ScanOats, where Oatly, Lantmännen, SLU and Lund University have teamed up to develop oat-based products, including work with the oat genome, breeding of new oat varieties, sustainable oat cultivation, processing of oats, oat diets for disease prevention and development of test facilities where you can test different varieties and parameters in the processing, such as protein content etc.

There is also a need in Denmark for a strengthened effort to drive development forward.