

Homemade oat-based drink products – easy, economic, and delicious way to benefit oat's health effects

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According to market studies, the consumption of oat-based products is growing strongly. Especially non-dairy, oat-based drinks and smoothies are popular with consumers. This growing consumer trend has positive effects on both consumers' health and well-being. Furthermore, it also affects the green transition and the climate changes (Global Trade, 2021).

Formation and benefits of beta-glucan

The beta-glucan in oats improves the gel formation in aqueous solution. The starch together with beta-glucan increase the viscosity of the solution making the product structure gel-like. An increase of beta-glucan at an appropriate temperature (25-35^{o}C) enhance the gelation, but at higher temperatures the gelation is reduced (BeMiller, 2018).

The beta-glucan brings a structure to the oat-based products; a viscosity that gives both improved texture and a rich mouthfeel to the products. The health benefits of beta-glucan have been recognized for a few decades. Beta-glucan lowers blood cholesterol, stabilizes blood sugar level, and reduces the risk of coronary heart disease. Both the European Food Safety Authority (EFSA, 2010) and the US Food and Drunk Food Agency (FDA, 1997) have granted health marketing authorizations for oat products, when the products contain enough beta-glucan. Products containing beta-glucan should remain as stable as possible to maintain the rheological properties, i.e., ability to form gel, until products are enjoyed.

However, the structure of beta-glucan is not permanent. Degradation of the structure occurs both during processing and storage. Degradation can be either enzymatic e.g., caused by the beta-glucose enzyme or non-enzymatic, e.g., acid hydrolysis (Kivelä et al., 2009). Also heating (to 120°C) and high-pressure processing (HPP processing, 300-1000 bar) degrades beta-glucan, significantly reducing the product viscosity (Kivelä, 2011).

In Finland, many oat-based products, like drinks and smoothies, are available on the market. These products are usually expensive. Many drinkable oat-based products can easily be made to an affordable price at home, e.g., using a smoothie-recipe (Table 1) developed and pre-tested at SeAMK, in Frami Food Lab. The recipe was developed for EQVegan Erasmus+ project (621581-EPP-1-2020-1-PT-EPPKA2-SSA) in spring 2022.

Oat - lingonberry smoothie	
Oat flakes	20 g
Water, cold	380 g
Lingonberries, mashed, no added sugar	25 g
Sugar	**10**(-15) g
Salt, pinch	0.25g
Mix with blender for 2 minutes Cook for 4 minutes, remember to stir while cooking	
Lingonberry whole juice/concentrate, sugar 30 g /100 ml	200 g
Add lingonberry juice into hot oatdrink-base, mix well and cool the drink before enjoying!	

Table 1. Recipe for an oat-lingonberry-smoothie. You can modify the recipe by using different berries and juices. Please, change the sugar amount depending on the berries or juice used. Test and find your favorite taste!

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