Oat SILK

DATA PACK

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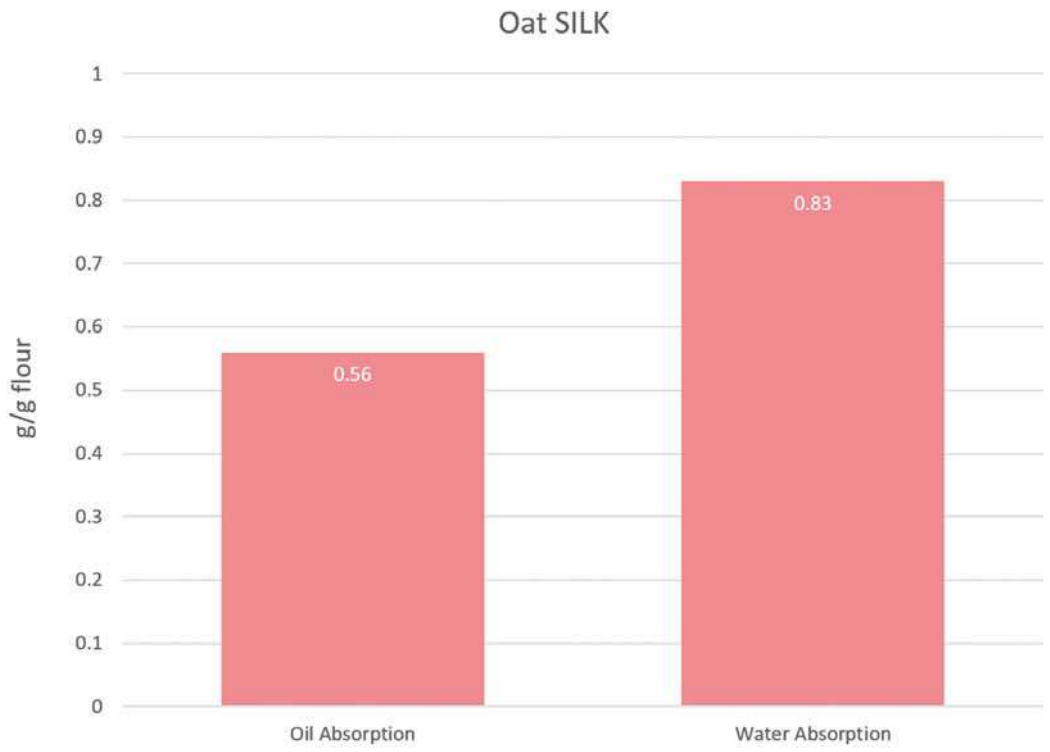
Oil and Water Absorption Capacity

OIL ABSORPTION

Oil absorption capacity was determined by dispersing 100 g of Oat SILK in Rapeseed oil and centrifuging the mixture at low speed. The oil absorption capacity is defined as the amount of oil retained per solid (Lin et al., 1974).

WATER ABSORPTION

Water absorption capacity was expressed as water binding capacity (AACC 56-30.01). Using this method, 100 g of Oat SILK was mixed with water and centrifuged at low speed. The water binding capacity is defined as the amount of water retained per solid.



RESULTS

One gram of Oat SILK will absorb 0.56 g of oil or 0.83 g of water.

The higher water absorption capacity of Oat SILK can be speculated to be the result of it containing a large proportion of water-absorbing fine particles. These particles are likely to contain fibres that bind water efficiently.

Independently tested by VTT, June 2016. Full report available upon request.

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Biodegradability Study (Manometric Respirometry Test)

BACKGROUND

A study was undertaken to measure the ready biodegradability of 4 oat-derived ingredients (Oat COM USP, Oat Lipid e, AvenaPLex, and Oat SILK 12) in a freshwater environment. Biodegradability is the mechanism whereby microorganisms such as bacteria and fungi break down the organic matter of a product and use the nutrients for energy and growth or make it available to the environment. This degradation is defined as the ratio of the Biochemical Oxygen Demand (BOD) to either the Theoretical Oxygen Demand (ThOD) or the Chemical Oxygen Demand (COD) within 28 days.

METHOD

The 28-day BOD was determined by a procedure following the OECD Guidelines for Testing of Chemicals reference 301F. To begin, the test products were added to water with mineral nutrient stock to allow the development of bacteria. The inoculum used for this test was activated sludge from a sewage treatment works receiving predominantly domestic waste. Following this, air was brought into a bottle to bubble up in a solution that works to capture the carbon dioxide. The air then passed into a test tube in which the bacteria used the oxygen to breathe and produce carbon dioxide, comprised of the oxygen present in the air and the carbon present in the substance. Finally, the carbon dioxide passed into a third bottle where there was again a solution to capture it.

The OXITOP^{R} measuring heads (a data collector used to determine how much carbon dioxide has been rejected by the bacteria) recorded readings of biodegradation every 112 minutes for 28 days. The test solutions were stirred at 20.2 – 23.3°C for the duration of the study.

An equation was used to calculate how much carbon dioxide was given off by the bacteria. The amount of oxygen taken up by the microbial population during biodegradation of the test substance is expressed as a percentage of ThOD or, less satisfactorily, COD. After 28 days the percentage of break down was assessed. It is standard to consider a substance to be easily biodegradable when this exceeds 60% in 28 days.

RESULTS

AvenaPLex, Oat SILK 12, Oat Lipid e and Oat COM USP all gave a positive result, exceeding 60% degradation relative to the ThOD value - or the COD value in the case of Oat Lipid e - with a maximum average degradation of 101%, 98%, 96%, and 91% achieved respectively on day 28.

CONCLUSION

When a product is biodegradable, it decomposes and the carbon and other elements in its molecules can be assimilated into new biomass so they can reappear in another form later. The findings of this study mean it can be concluded that AvenaPLex, Oat SILK 12, Oat Lipid e and Oat COM USP are readily biodegradable under environmental conditions.

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