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The effect of extrusion processing on solubility and molecular weight of water-soluble arabinoxylan

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Arabinoxylan is a non-starch polysaccharide (NSP), which is one of the most important polysaccharides contained within cereal grains. Wheat endosperm pentosan and rice bran contain a significant amount of arabinoxylan (7 % in rice bran and 10-12 % in wheat endosperm pentosan).

Several methods have been used for arabinoxylan extraction with varying degrees of success e.g. enzymatic and alkaline treatment. Yet, the use of extrusion alone as a pre-treatment to increase the yield and reduce the molecular weight in wheat endosperm pentosan and rice bran has not been investigated.

The samples (wheat pentosan and rice bran) were extruded using a Twin-screw extruder at a range of screw speeds (80 and 160 rpm) and barrel temperatures range (80 to 140 °C) with a throughput of 30 Kg hr⁻¹ and moisture content of 25%. Arabinoxylans were extracted with water and the extraction yield and molecular weight was determined using size exclusion high-pressure liquid chromatography system.

It was found that increasing screw speed from 80 rpm to 160 rpm, did not effect the extraction yield ($p < 0.05$) of arabinoxylan from either the wheat endosperm pentosan or the rice bran. However, the molecular weight of the extracted arabinoxylans from pentosan was found to decrease with increasing screw speed in wheat endosperm pentosan. These low molecular weight arabinoxylans have been suggested as immunomodulators.

Biography

Abdulmannan Fadel is a PhD Student in Manchester Food Research Centre at Manchester Metropolitan University.

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