Brewer’s spent grain: source of value-added polysaccharides for the food industry in reference to the health claims

Brewer’s spent grain (BSG) is the most abundant by-product of the brewing industry, constituting approximately 85 % (w/w) of the total by-products generated during beer production. Rich in cellulose and non-cellulosic polysaccharides, lignin, and proteins, BSG provides extra nutritional value, thereby arousing the interest of the food industry. Annually, around 3.4 million t of BSG are produced within the European Union, and Germany contributes approximately 2 million t. BSG is reused either substantial or energetic. However, its main application has been limited to animal feeding. Based on the intense global pressure toward green environmental technology and increasing regulations in the feed sector, alternative application fields have gained importance. Because of its high protein and fiber contents, BSG can be an attractive source for value-added products in human nutrition. The focus is on the reported health effects of (1–3,1–4)-β-d-glucan and arabinoxylan (AX). Several scientific studies have shown that barley (1–3,1–4)-β-d-glucan reduces blood cholesterol levels. A cause and effect relationship has been established between the consumption of AX from wheat endosperm and the reduction of postprandial glycemic responses. The intention of this review is to focus on the extraction of (1–3,1–4)-β-d-glucan and AX from BSG as a source of value-added compounds for use as a nutraceutical. In view of AX and...
(1–3,1–4)-β-d-glucan yield, different methods of extraction are presented. Finally, technological trends and future perspectives to expand this market are discussed, focusing on promising strategies such as the use of pressurized hot water extraction.