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### Impact of processing on barley $\beta$ -glucan and its role in human health

Glucan is a soluble dietary fiber found in barley grains at a wide concentration range (4-11%) subject to barley type. It is also present in other cereal grains such as oats and wheat. This grain constituent has received considerable interest from academia, industry and regulators due to its positive functions in human health including lowering blood cholesterol and glucose. In fact, large number of clinical trials and meta-analyses have shown the beneficial health effects of barley β-glucan which leads to the endorsement of a health claim for the relationship between barley β-glucan and reduced risk of heart disease in several countries including USA, Canada and UK. This opens the door for food industry and researchers to come up with innovative barley foods that contain the physiological dose of β-glucan (3 g/day). In addition, it is generally accepted that the efficacy of β-glucan in the diet depends on its physiochemical characteristics in foods specifically viscosity which is related to the amount and molecular weight of β-glucan solubilized in the human body. Thus the functionality of β-glucan in humans is not only related to the amount of β-glucan in foods but also linked to its molecular properties. Studies have shown that different processing methods affect physiochemical characteristics of β-glucan in barley to various extents. Research at Agriculture and Agri-Food Canada's Guelph Research and Development Centre has led to the development of several barley functional foods such as partially pearled or whole grain barley as rice substitute, barley pasta and β-glucan enriched bread. These functional foods will be discussed in details in terms of the impact of processing on their nutritional properties and role in human health.

#### **Biography**

El-Sayed M Abdel-Aal is a Senior Research Scientist with Guelph Research and Development Centre at Agriculture and Agri-Food Canada where he specialized in grain-based functional foods and natural health products. His 200 publications and presentations encompass chemistry, functionality, nutritional and antioxidant properties of a diverse array of primitive, modern and newly-developed grains. Currently, he is the Chair of the Bioactive Compounds Technical Committee and Vice Chair for the Nutrition Division at the American Association of Cereal Chemists International. He has been an associate faculty member at the University of Guelph and adjunct Professor at the University of Toronto, and Editorial Board Member for several scientific journals.

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