

DOKUMENTATABLAD  
 enl SIS 61 41 21

Organization <b>LUND UNIVERSITY</b> Department of Applied Nutrition and Food Chemistry Chemical Centre, Lund University P.O. Box 124, S-221 00 Sweden		Document name <b>DOCTORAL DISSERTATION</b>	
		Date of issue December 15, 1995	
		CODEN:	
Author(s) Helena Liljeberg		Sponsoring organization The Cerealia Foundation for Research and Development	
Title and subtitle <i>Nutritional Properties of Starch in Bread - Impact of the Choice of Raw Material and/or Processing Conditions</i>			
Abstract <p>             It has now become increasingly clear that foods which release the starch slowly, thus favouring low postmeal responses of glucose and insulin in the blood, are to be preferred from a nutritional point of view. Moreover, an accumulating body of knowledge suggests that the delivery of indigestible, or resistant starch (RS) to the large bowel is connected with advantageous physiological effects. The purpose of the present work was to evaluate the possibilities to modify the nutritional characteristics of starch in bread by the choice of raw material and/or processing conditions. The impact on postmeal glycaemia and insulinaemia was investigated in healthy subjects, and RS content measured <i>in vitro</i>. Favourably low increments in glucose and insulin were found with bread made from intact cereal grains of wheat, rye or barley. Bread based on barley kernels also contained high levels of RS. In contrast, bread made from wholemeal barley or porridges prepared from wholemeal barley or oats, elicited equally high metabolic responses as a white bread. Consequently, dietary fibre content in common cereals has no influence on postprandial glycaemia, unless maintained in an intact botanical structure which obstruct the availability of starch to amylolysis. However, <i>lente</i> flour-based breads were obtained from Prowashonupana barley with an elevated content of viscous dietary fibre (18% <math>\beta</math>-glucans). Also, sourdough-fermented bread or bread with added lactic acid or Na-propionate reduced postmeal glycaemia and insulinaemia. The mechanism for the blunting effect with lactic acid, appears to be related to a reduced accessibility of starch in the digestive tract, whereas the presence of Na-propionate reduced the rate of gastric emptying. Compared with a control bread, a higher satiating effect was registered with the barley kernel bread as well as the bread added with Na-propionate. Moreover, it was possible to increase RS yield also in flour-based bread by use of a low-temperature/long-time baking process. Addition of lactic acid to the dough further promoted RS formation. The highest RS content in flour-based bread was found in a low-temperature/long-time baked bread made from high-amylose Glacier barley. This bread also reduced the rate of amylolysis of the bulk of starch. In particular, the <i>lente</i> bread products described in the present work could be explored in the dietary management of diabetes.           </p>			
Key words bread, glycaemia, insulinaemia, humans, cereals, grain, starch, amylose, resistant starch, dietary fibre, $\beta$ -glucans, sourdough fermentation, organic acid/salt, amylolysis, gastric emptying, phytate			
Classification system and/or index terms (if any)			
Supplementary bibliographical information		Language English	
ISSN and key title		ISBN 9187108	
Recipient's notes		Number of pages 188	Price
		Security classification	
Distribution by (name and address)			

I, the undersigned, being the copyright owner of the abstract of the above-mentioned dissertation, hereby grant to all reference sources permission to publish and disseminate the abstract of the above-mentioned dissertation.

Signature

*Helena Liljeberg*

Date

October 30, 1995