

# Glycemic index of wheat-flour bread

Barbara Borczak  
University of Agriculture in Krakow  
Department of Human Nutrition Faculty of Food Technology

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- ▶ Bread plays a fundamental role in human nutrition. After milk product and potatoes, cereals are the third largest group of products in the daily food ration in Poland
  - ▶ Consumption of products with a low glycemic index, and rich in dietary fiber, is recommended in the prevention of diet-related chronic diseases such as type 2 diabetes, obesity, heart disease and cancer
  - ▶ Unfortunately, white bread **has a high glycemic index**
  - ▶ Current efforts aim to obtain a product characterized by a **low glycemic** response, **good nutritional value**, and **a quality** which is accepted by consumers.

# Glycemic index (GI)

The glycemic index (GI) was introduced in 1981 by Jenkins and is a ranking of foods based on postprandial blood glucose response compared with a reference food, e.g. glucose

<b>HIGH GI PRODUCTS</b> <b>&gt;70 %</b>	<b>MEDIUM GI PRODUCTS</b> <b>56 % - 69 %</b>	<b>LOW GI PRODUCTS</b> <b>&lt;55 %</b>
e.g.	e.g.	e.g.
wheat flour bread	beet	Sourdough whole-meal bread
cornflakes	sucrose	all-bran cereals
gelatinized starch	white rice	apples

Foster-Powell , 2002



# Experiments

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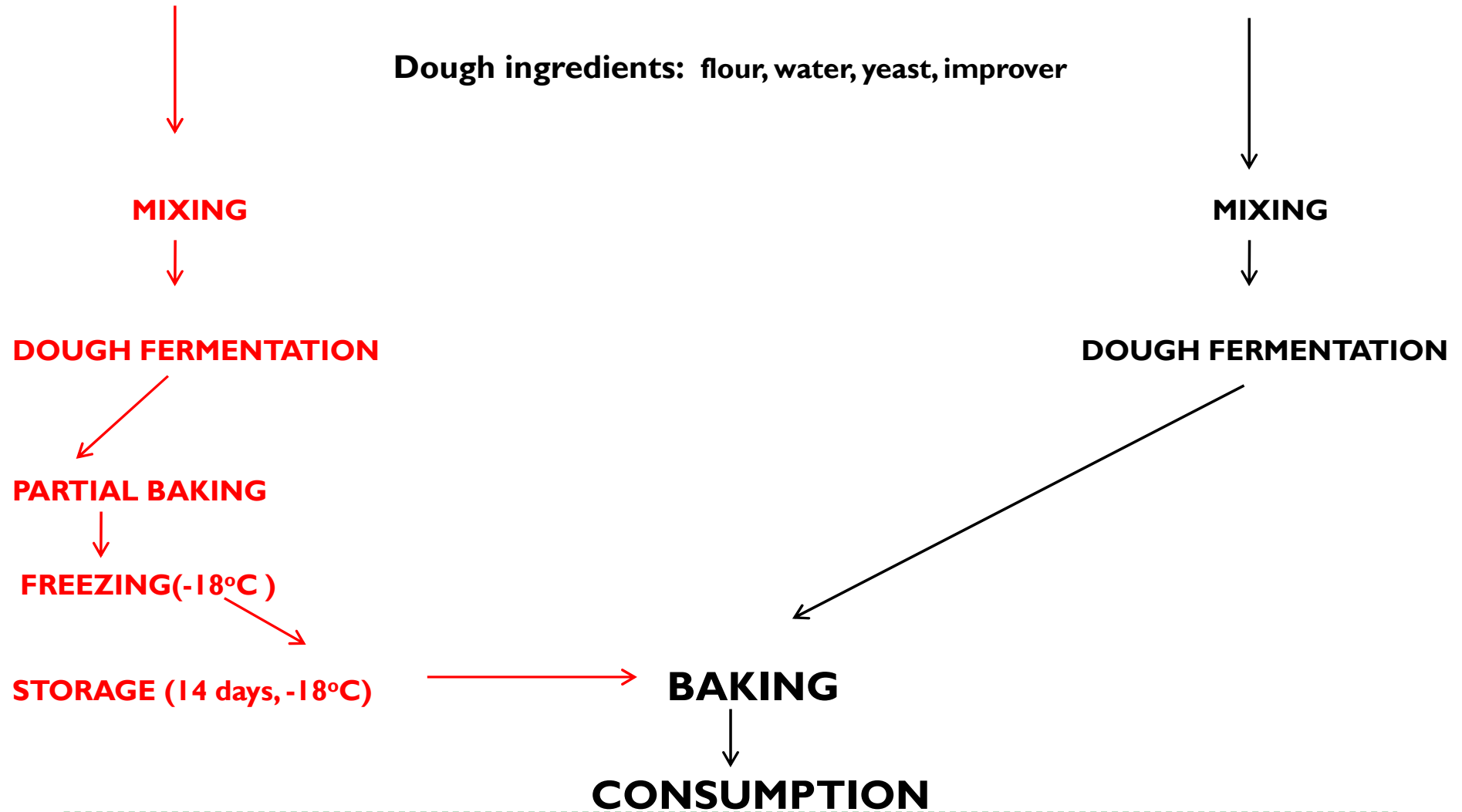
- Application of the freezing process to the baking technology in so-called “postponed baking” combined with the addition of dehydrated sourdough, and the impact of these innovations on the glycemic response of white wheat-flour rolls.
- This approach was innovative, because freezing (postponed baking) and dehydrated sourdough were applied together for the first time in the white wheat-flour rolls production.



# Bread baking technologies

## Postponed

## Conventional





## **The material consisted of:**

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Four types of wheat rolls were tested:

- ▶ (1) Conventionally baked (control sample);
- ▶ (2) Conventionally baked with dehydrated sourdough – CONV+Sourdough;
- ▶ (3) Postponed baked – POST;
- ▶ (4) Postponed baked with dehydrated sourdough – POST+Sourdough

# Results

Glycemic indices of white wheat –flour rolls (Average values with standard errors of the mean)

	CONV	CONV+Sourdough	POST	POST+Sourdough
	MEAN ± SEM			
GI value [%]	87 ± 11 <sup>a</sup>	63 ± 7 <sup>bc</sup>	67 ± 3 <sup>ab</sup>	43 ± 4 <sup>c</sup>

*CONV- conventionally baked; POST- postponed baked  
Data are shown as a mean ± SEM. Different letters in lines show significantly different values at P ≤ 0.05.*

**B. Borczak, E. Sikora, M.Sikora, I.Van Haesendonck.** The impact of sourdough addition to frozen stored wheat-flour rolls on glycemic response in human volunteers. *Accepted for publication in Starch (Die Stärke)*, (DOI:10.1002/star.201100055).

# Conclusion

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- ▶ The production of baked goods by the use of freezing (postponed baking) is simple, and application of dehydrated sourdough in powdered form additionally simplifies the traditional sourdough baking process for use in industrial conditions. Thus, the 24% reduction of GI upon addition of dehydrated sourdough and the 44% reduction on application of both dehydrated sourdough and freezing is a rare achievement in the production of white wheat rolls.
- ▶ It should be also emphasized that white wheat bread is preferred by consumers to other less refined breads, although it is a cereal product of poor nutrient density.

THANK YOU 😊



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