

## **Metabolomics in Food science and Nutrition**

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Metabolomics is emerging omic science which help in the quantification of different metabolites of living systems that reveal the functional status of any organism. Metabolomics approach can be used in many scientific areas including drug discovery, toxicology, food science, diagnostic and functional genomics, etc. In this project, metabolomic approach has been used to understand the metabolic response due to dietary intervention.

Previous studies have shown that consumption of rye product is beneficial over wheat. Lower postprandial insulin response was observed following rye consumption compared to wheat. This observation is known as the “rye factor” but the mechanism is not well understood. Thus to solve this mystery and understand the mechanism behind lowered insulin response after rye intervention compare to wheat present research was conducted.

For the design of the project, cross sectional studies was conducted in 19 healthy, non diabetic postmenopausal women. They were provided with endosperm rye and wheat diet in the interval of 1-2 weeks and their fasting as well as postprandial blood samples were collected in various time points till 180 minutes. Then  $H^1NMR$  technique was used to determine the possible metabolites in serum samples which could explain the mechanism behind the insulin response.

The branching amino acid (leucine, isoleucine and valine) in addition to other insulinogenic amino acids was found to be lowered after rye consumption which explained the lowered insulin response after rye consumption compare to wheat. The mechanism by which these amino acids stimulate the insulin secretion may involve both transcriptional and mitochondrial effects.

Thus the present study confers that discrepancies in amino acid metabolism could be one of the probable mechanisms that explain the decrease in insulin response following rye intervention compare to wheat.

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