Ref : 149/612

EFFECT OF THE INTAKE OF HIGH-SDS PRODUCT ON METABOLIC AND INFLAMMATORY MARKERS IN SUBJECTS WITH IMPAIRED GLUCOSE TOLERANCE

Topic 4 Nutrition, public health, chronic diseases

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INTRODUCTION

- Several studies performed in Healthy normal-weight subjects have shown that the ingestion of high-Slowly Digestible Starch (SDS) cereal products led to lower postprandial glycemic response with a non exacerbated insulin response. A study in overweight subjects confirmed this effect.
- The etiology of diabetes is a continuum from healthy status to diseased status : what is the effect of high-SDS cereal product ingestion on glycemic response in subjects with impaired glucose metabolism and what is the impact on inflammatory process & oxidative stress ?

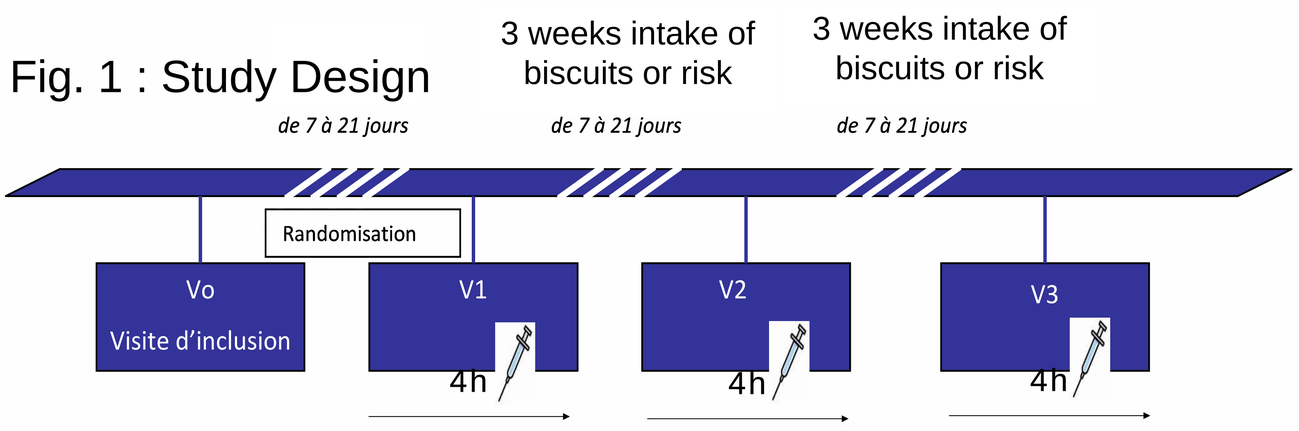
OBJECTIVES

Our objective was to compare metabolic and inflammatory responses following the ingestion of cereal products high in Slowly Digestible Starch (SDS) in subjects with impaired glucose tolerance.

METHODS / DESIGN

- Mono-center, randomized, open study
- Inclusion of overweight subjects with impaired glucose tolerance
- Cereal products consumed at breakfast for 3 weeks prior each test session

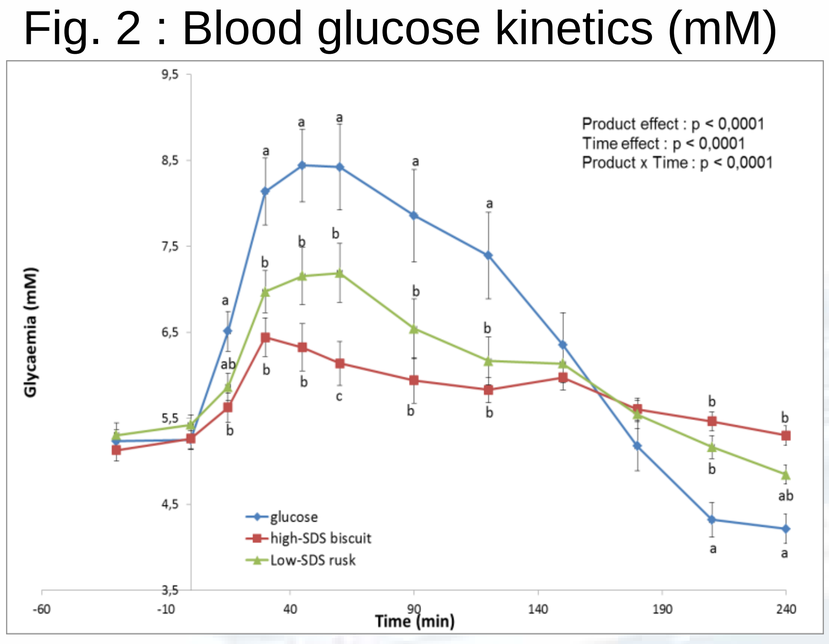
Fig. 1 : Study Design



- 3 test sessions : all meals provided 54g of available CHO
  - A breakfast including a biscuit high in SDS (SDS = 16,9 g/100 g and %SDS/av. starch = 43,2%)
  - A breakfast including a rusk low in SDS (SDS = 0,5 g/100 g and %SDS/av. starch = 0,8%)
  - A glucose solution
- 21 subjects recruited and 20 completed the study (age : 45,9 ± 9,6 y, BMI : 29,7 ± 2,3 kg/m² and CRP range : 0,1 – 9,2 mg/L)

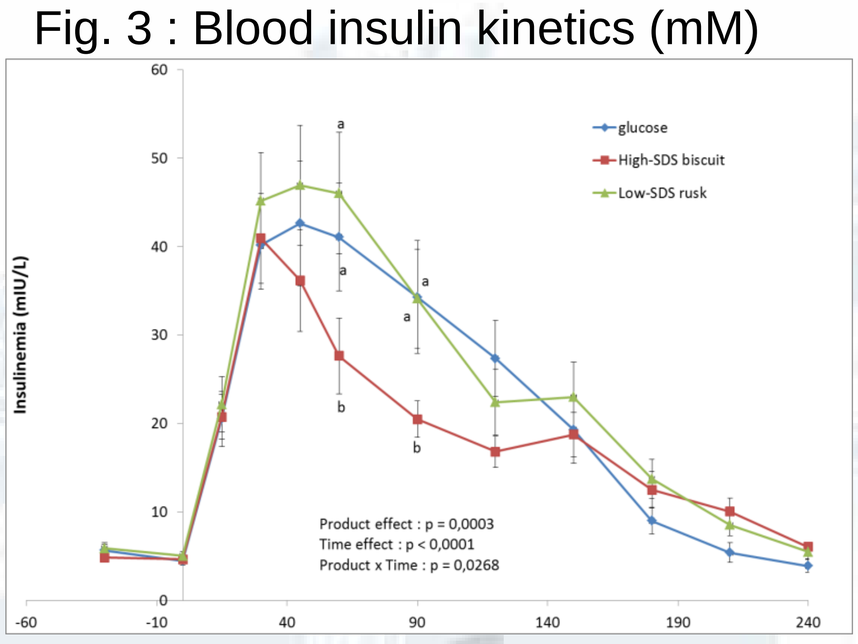
RESULTS

Fig. 2 : Blood glucose kinetics (mM)



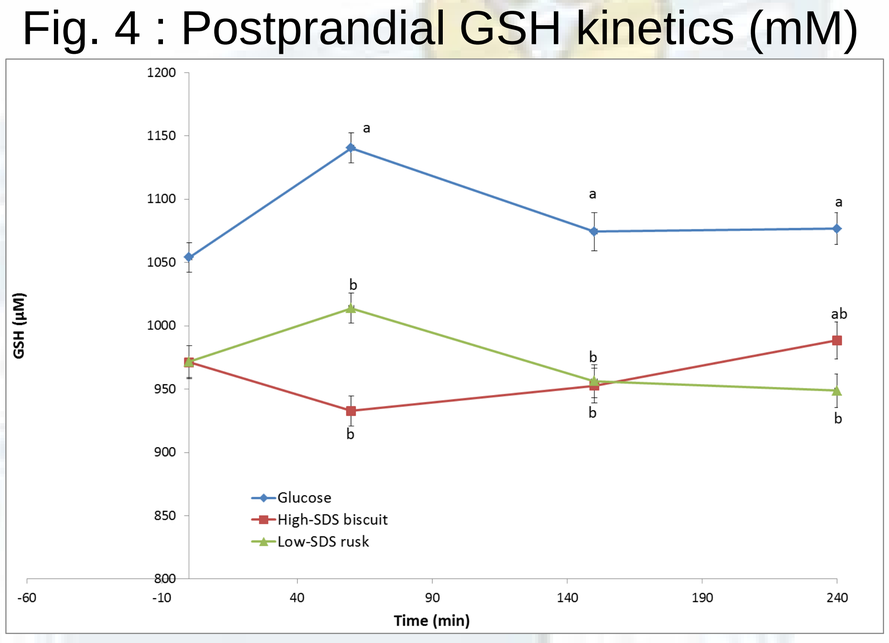
Comparing the 2 cereal products, **postprandial glycaemia over the 2 first hours** following the consumption of **high-SDS biscuit was 32% lower** compared to low-SDS rusk

Fig. 3 : Blood insulin kinetics (mM)



Postprandial insulinemia after ingestion of the **high-SDS biscuit was lower** compared to glucose solution and low-SDS rusk

Fig. 4 : Postprandial GSH kinetics (mM)



- **No difference** on **CRP, IL-6 and TNFα**.
- **No effect** on **GSSG** and on **urinary isoprostanes**.
- **Higher GSH and a lower MDA** with glucose solution compared to cereal products; no difference between cereal products

CONCLUSIONS

- High-SDS biscuits induced the lowest postprandial glycemic response associated with the lowest insulin demand in overweight subjects with impaired glucose tolerance
- No effect of lower glycemic response and postprandial inflammatory marker improvement (CRP, IL-6, TNFα).
- Higher values even at baseline for MDA and GSH with the two cereal products compared to the glucose solution : should it be a transitory pro-inflammatory effect?

12th European Nutrition Conference
FENS 2015
Berlin | Germany | October 20 - 23
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organised by German Nutrition Society
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