



AFTER

CONGRÈS

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Akpan "a yoghurt-like cereal product from West Africa" beneficially modulates bacterial composition and activity within the faecal microbiota

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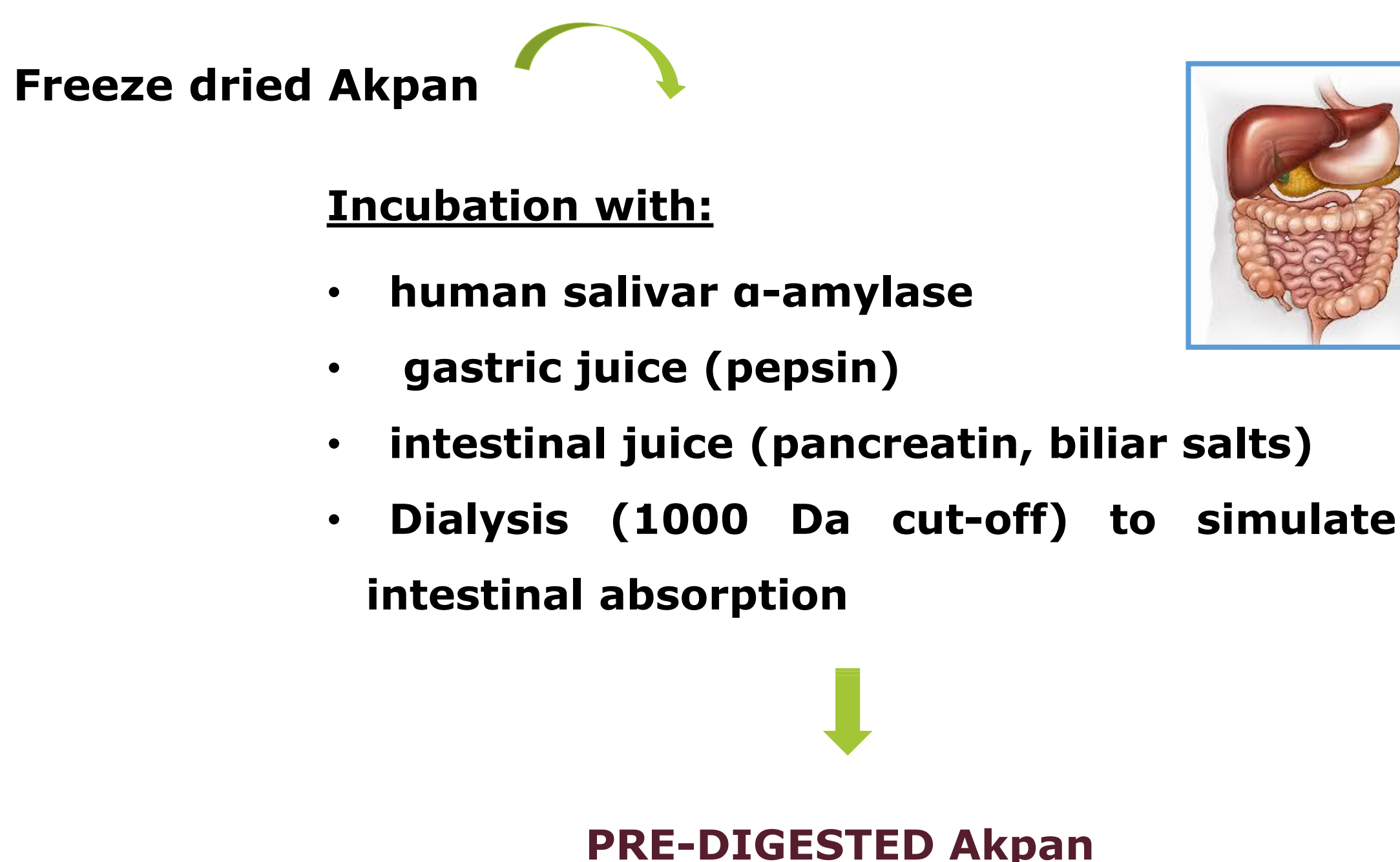
Introduction

The diet is considered a major driver for changes in gut bacterial diversity that may affect its functional relationships with the host. In fact, dietary components are susceptible for metabolism by the intestinal microbial ecosystem, particularly influencing the growth and the metabolic activity of the dynamic bacterial populations thriving in the human colon. From a nutritional point of view, it has fostered the research and industrial interest in identifying food with prebiotic activities. In this sense, the consumption of cereal has always been associated with beneficial health effects, especially in the gastrointestinal tract (GIT) modulation. Polysaccharides derived from cereal are readily available substrates for bacterial fermentation in the human GIT. In this context, Akpan is a yogurt-like product traditionally prepared in Benin from ogi or mawè, two fermented cereal mash products. These intermediate products are precooked and later mixed extemporally with additives such as milk, sugar and ice before consuming. However, to our knowledge, there are no scientific studies which assess the impact of Akpan on the composition and metabolism of the intestinal microbiota.

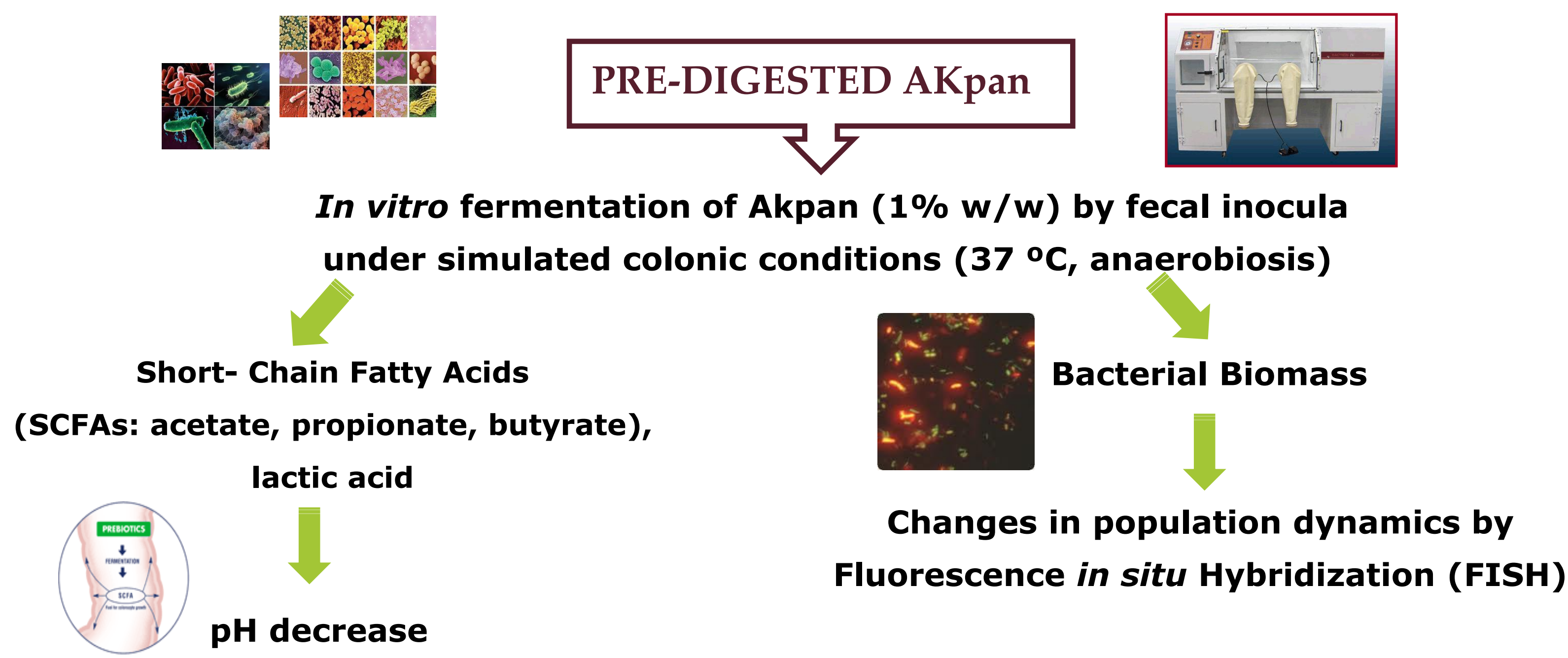
The aim of this study was to assess the potential prebiotic properties of Akpan using fecal inocula (obtained from three healthy human donors) by *in vitro* fermentation.

Materials and Methods

1. *In vitro* Simulated Gastrointestinal Digestion



2. *In vitro* Fermentability Assessment of Akpan



Results

SCFA production in fecal cultures

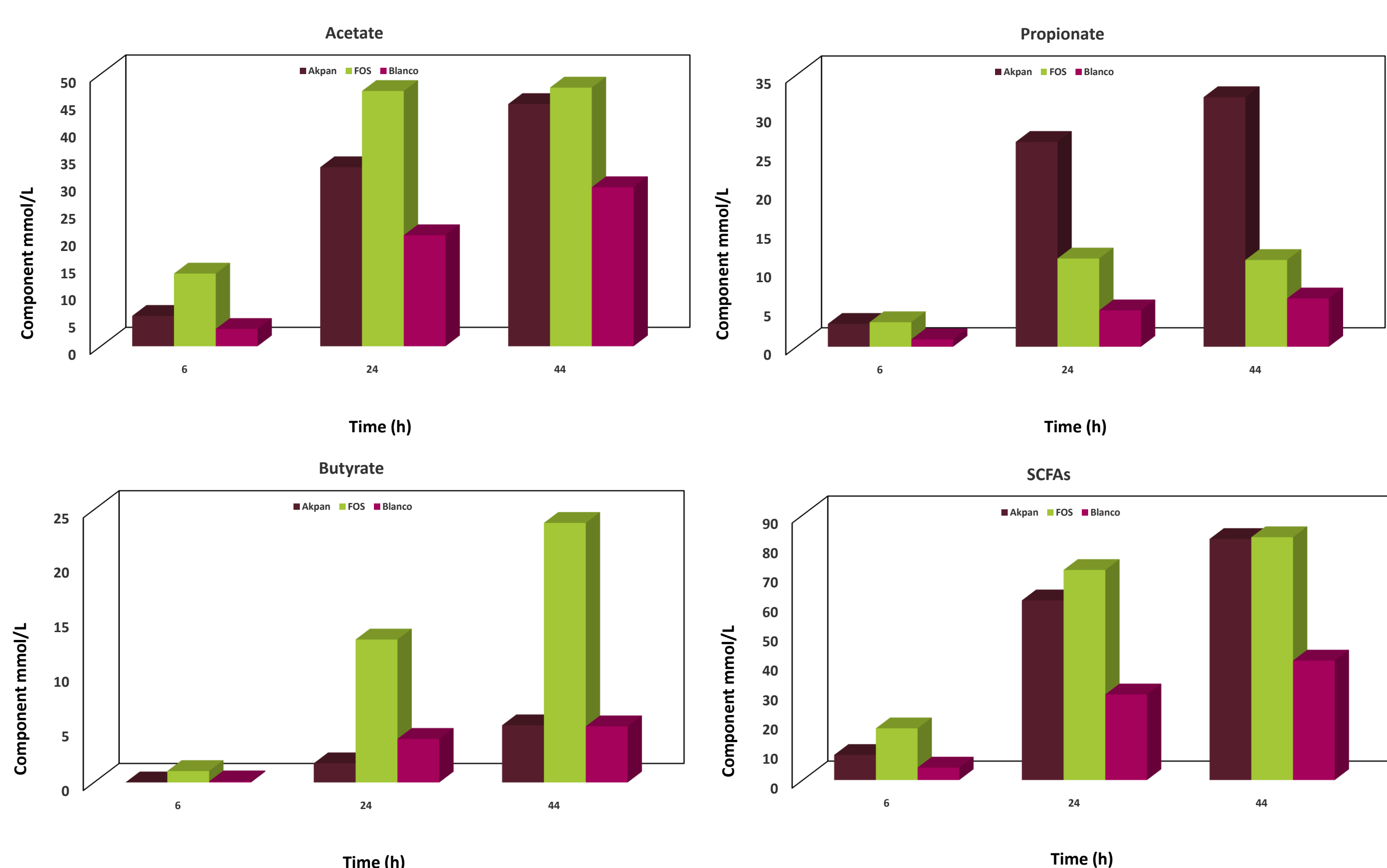


Figure 1. SCFA contents at 6, 24 and 44 h of fermentation of Akpan in fecal cultures

Dynamics of the *Bifidobacterium* population

Clearly higher increases of *Bifidobacterium* population levels were found along incubation in the presence of Akpan than in negative control culture, which was indicative of a stimulatory effect of this substrate upon bifidobacteria. The major increase in the populations of *Bifidobacterium* was observed in the period 6-24 h, alongside with the highest increase in acetate production.

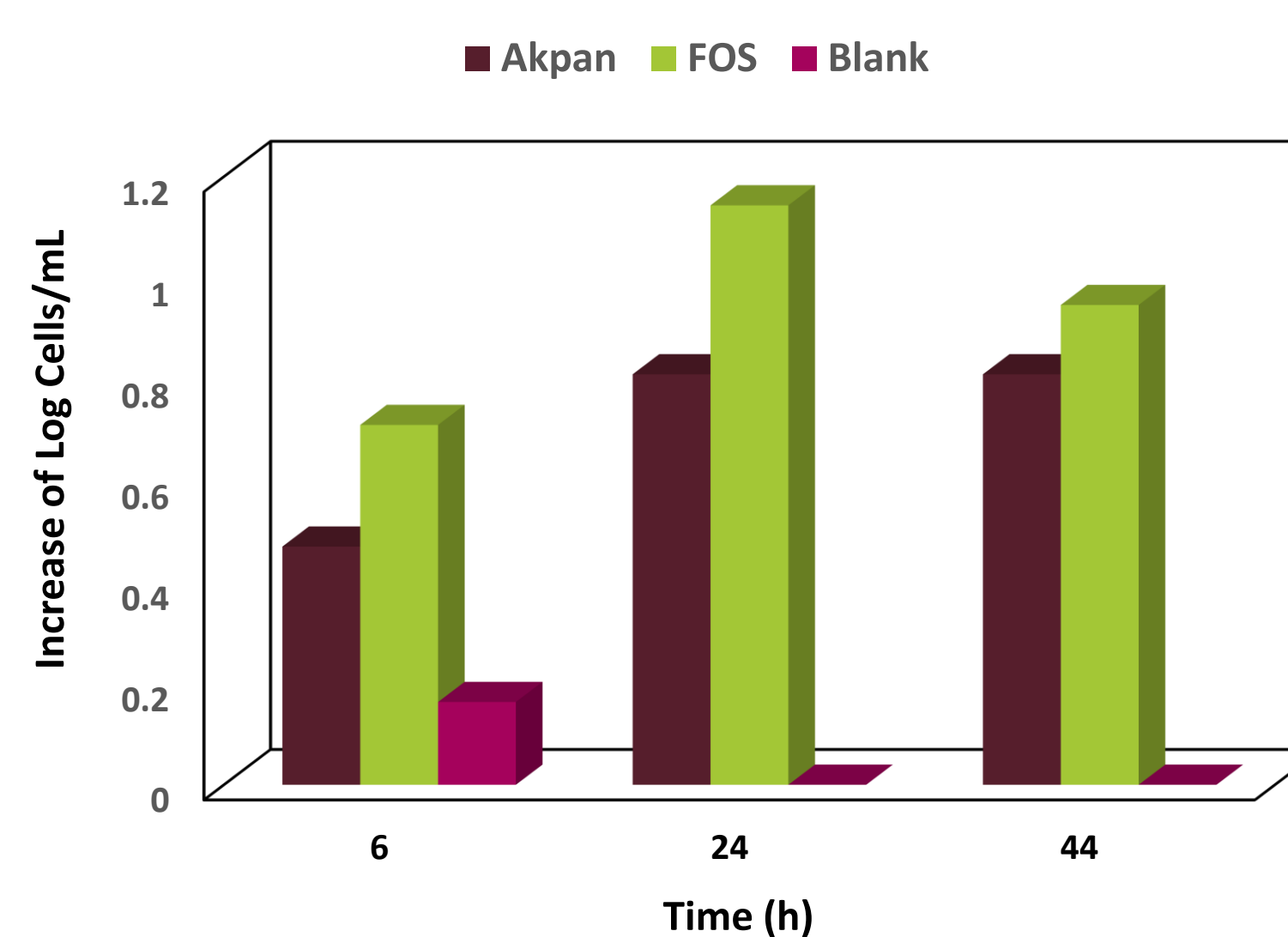


Figure 2. Increase (with respect to time 0 h) of *Bifidobacterium* counts determined by FISH in fecal cultures using Akpan as the carbon source. A negative control without carbon source and a positive control with FOS were also tested

- ✓ Results showed as acetic, propionic and butyric acid could be detected in all fermentation samples and all fermentation times.
- ✓ Fermentation of Akpan resulted in a significant increase in total SCFAs concentrations after 6 h.
- ✓ Acetate was the dominant SCFA produced during Akpan fermentation and a significant increase was observed after 6 and 24 h.
- ✓ The highest propionate concentration corresponded to media containing Akpan.

Conclusions

- ✓ The study regarding the *in vitro* fermentation properties of Akpan with human faecal samples was carried out for the first time.
- ✓ The experimental results confirmed that Akpan selectively stimulated the beneficial gut microbiota, which promoted a favorable SCFA profile.
- ✓ Although more studies are necessary, specially those regarding other bacterial groups and fermentation products, this work is a basis for future research showing the Akpan as a prebiotic food, or strengthen its use as a prebiotic ingredient.

