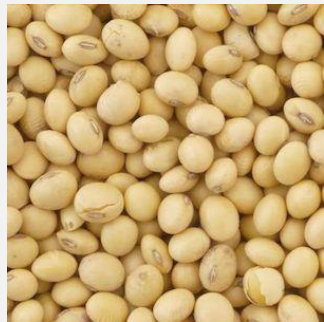
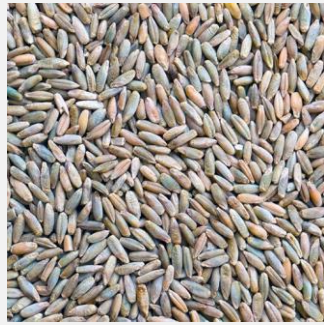




Prebiotic effect of by-products
assessed by combined *in vitro* fermentation
and **primary cultured porcine immune cells**

J. Uerlings, M. Schroyen, E. A. Sureda, J. Bindelle, E. Willems, G. Bruggeman and N. Everaert

BY-PRODUCTS IN THE FEED OF PIGLETS AT WEANING

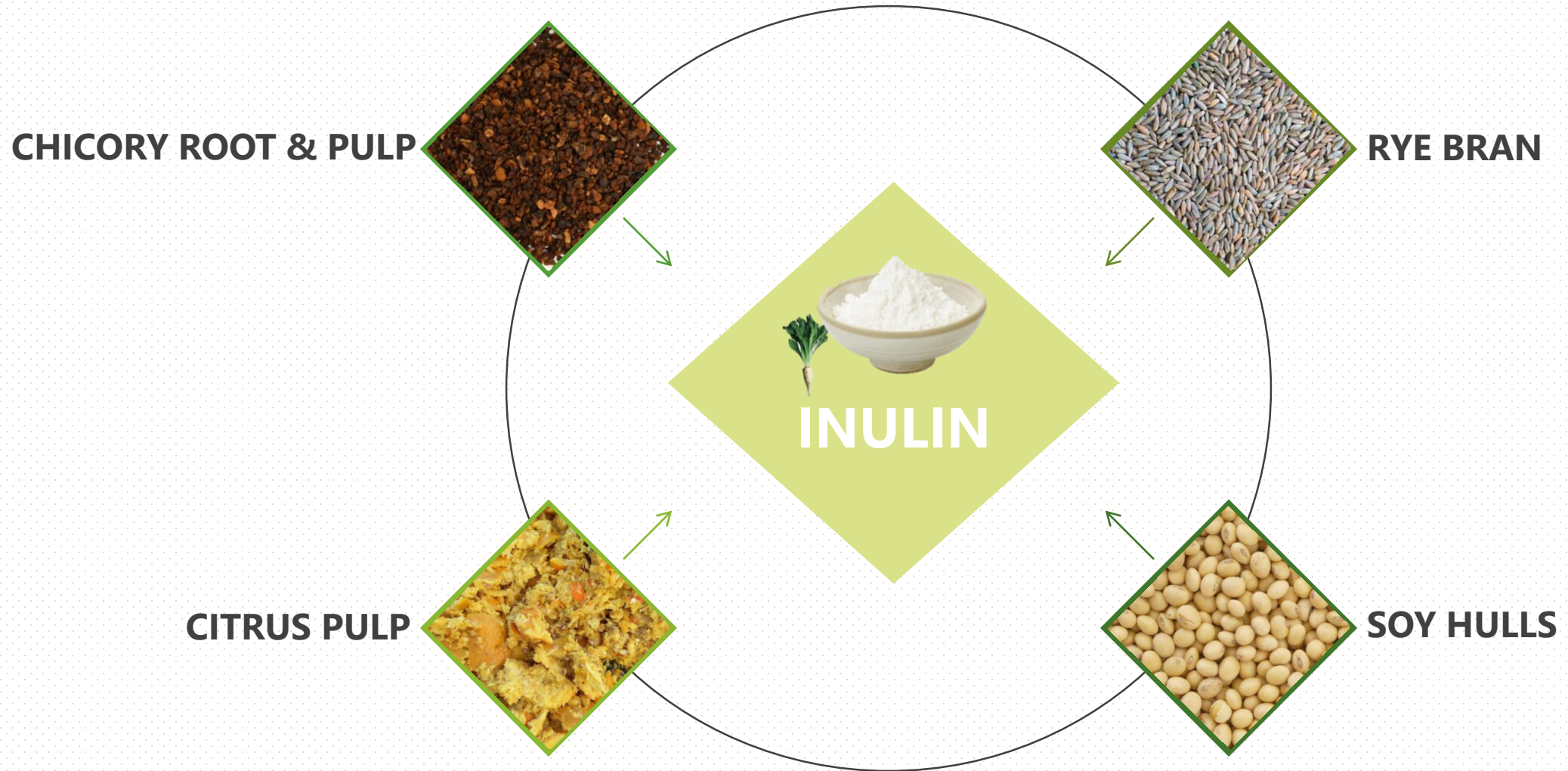


Microbiota shifts

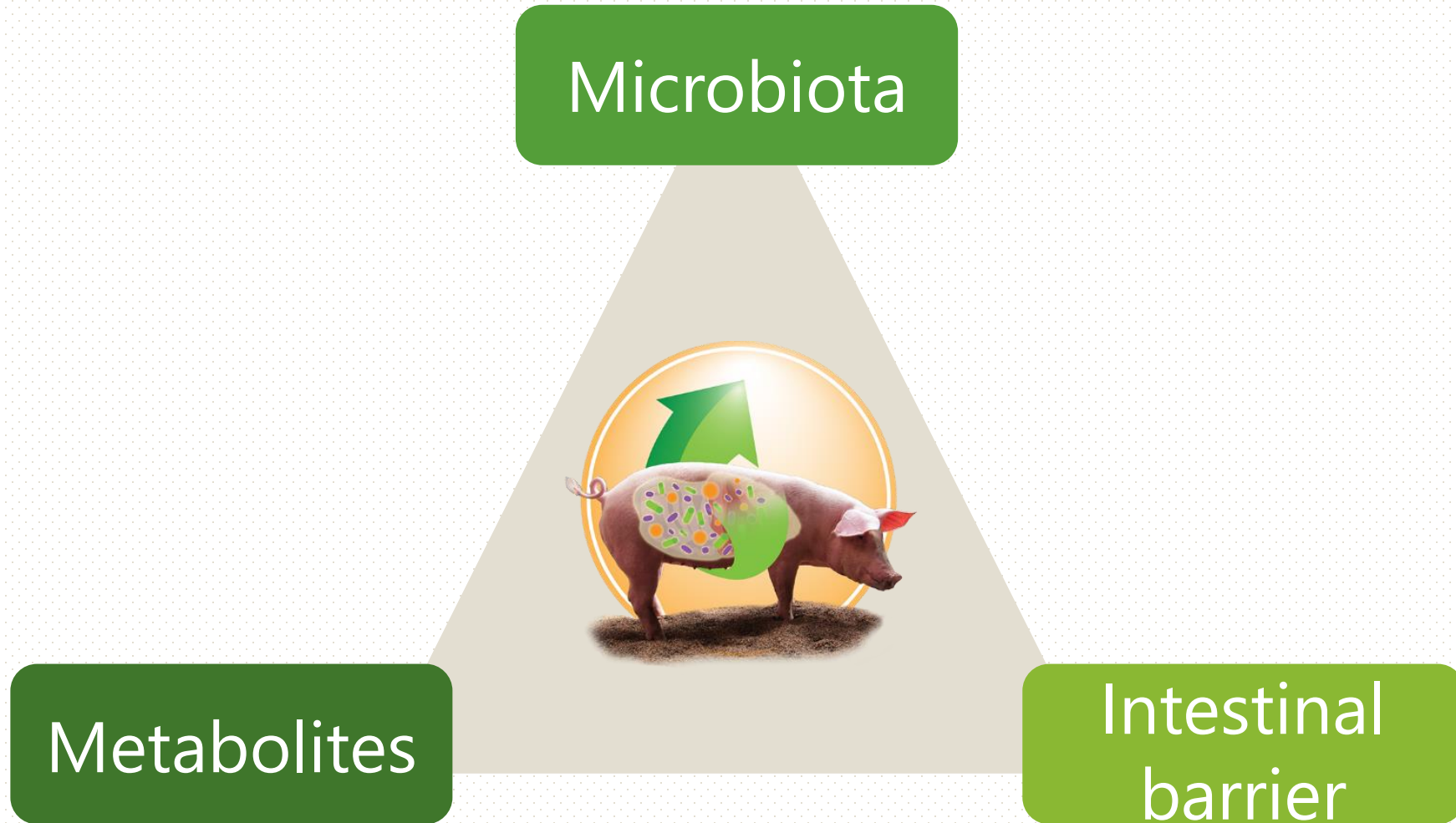
Short-chain fatty acids

Gut barrier and inflammation

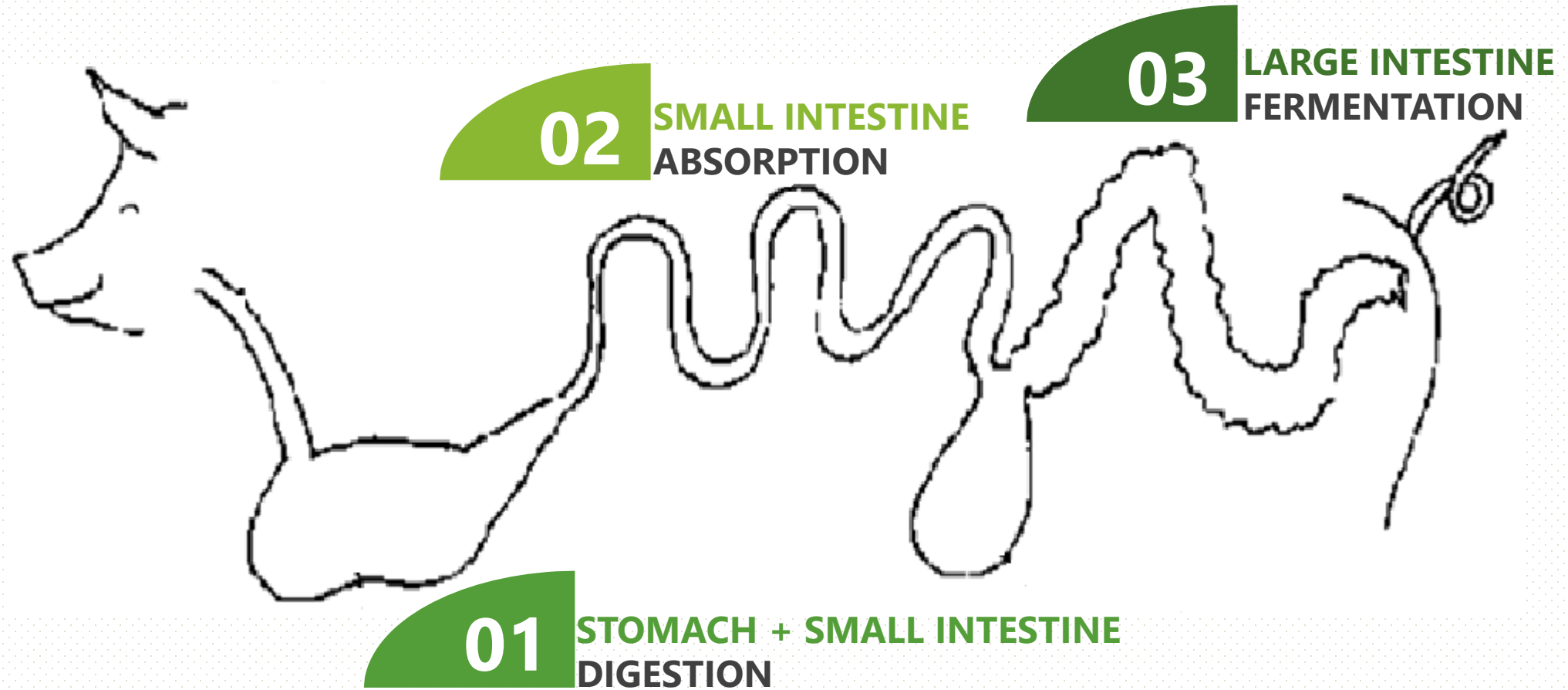
BY-PRODUCTS



THE INTERPLAY OF INTESTINAL HEALTH



METHODOLOGY INTESTINAL FERMENTATION



METHODOLOGY INTESTINAL FERMENTATION

1

STOMACH AND INTESTINAL DIGESTION

Pepsin hydrolysis
Pancreatin hydrolysis



2

INTESTINAL ABSORPTION

Dialysis



3

COLONIC BATCH FERMENTATION

Feces inoculum
+
Ingredient
+
Mucin carriers



METHODOLOGY INTESTINAL FERMENTATION

qPCR of beneficial populations
in the fermentation supernatants

Microbiota

HPLC for SCFA production
in the fermentation supernatants

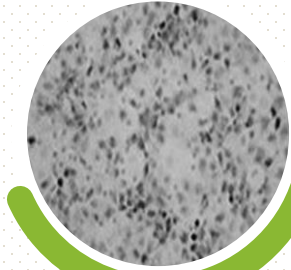
Metabolites

Intestinal
barrier



METHODOLOGY INTESTINAL BARRIER

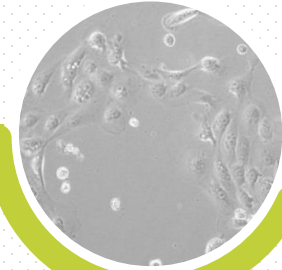
BARRIER INFLAMMATION



PBMC

Peripheral blood mononuclear cells

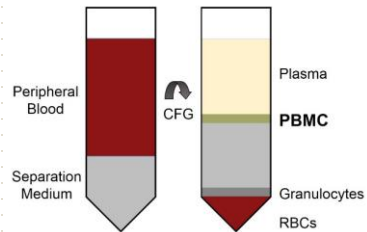
BARRIER INTEGRITY



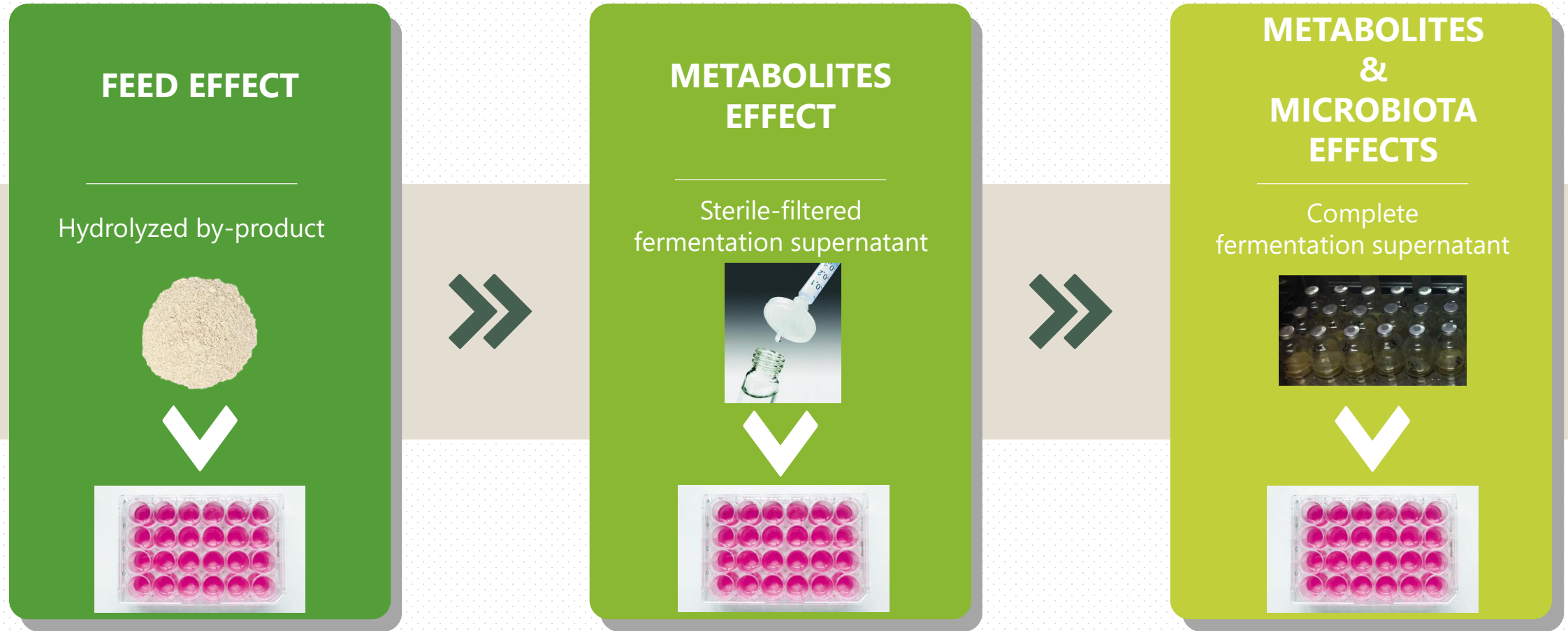
IPEC-J2

Intestinal porcine epithelial cells

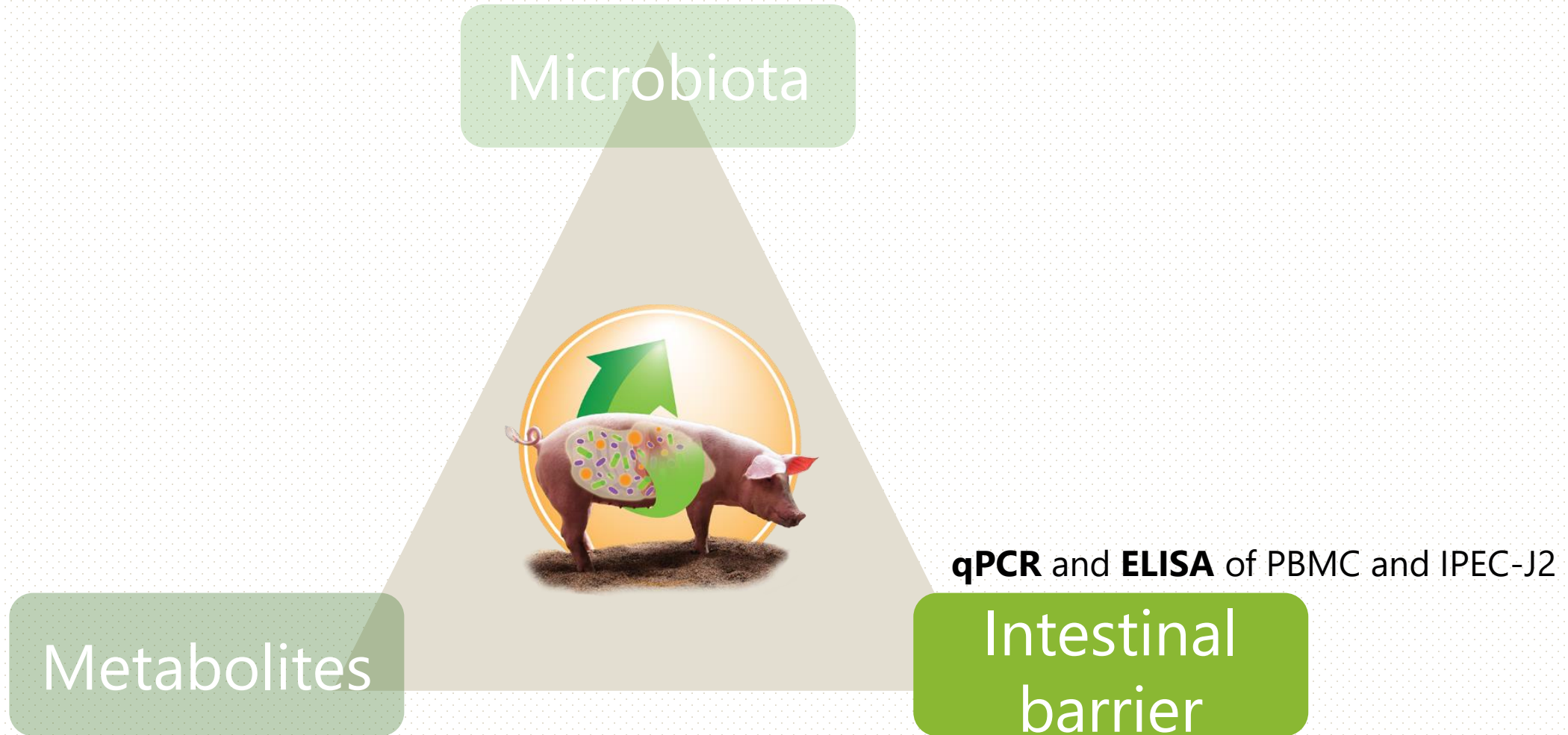
**Intestinal
barrier**



METHODOLOGY INTESTINAL BARRIER



METHODOLOGY INTESTINAL BARRIER



COMBINED *IN VITRO* FERMENTATION AND CELL CULTURE

qPCR of beneficial populations
in the fermentation supernatants

Microbiota

HPLC for SCFA production
in the fermentation supernatants

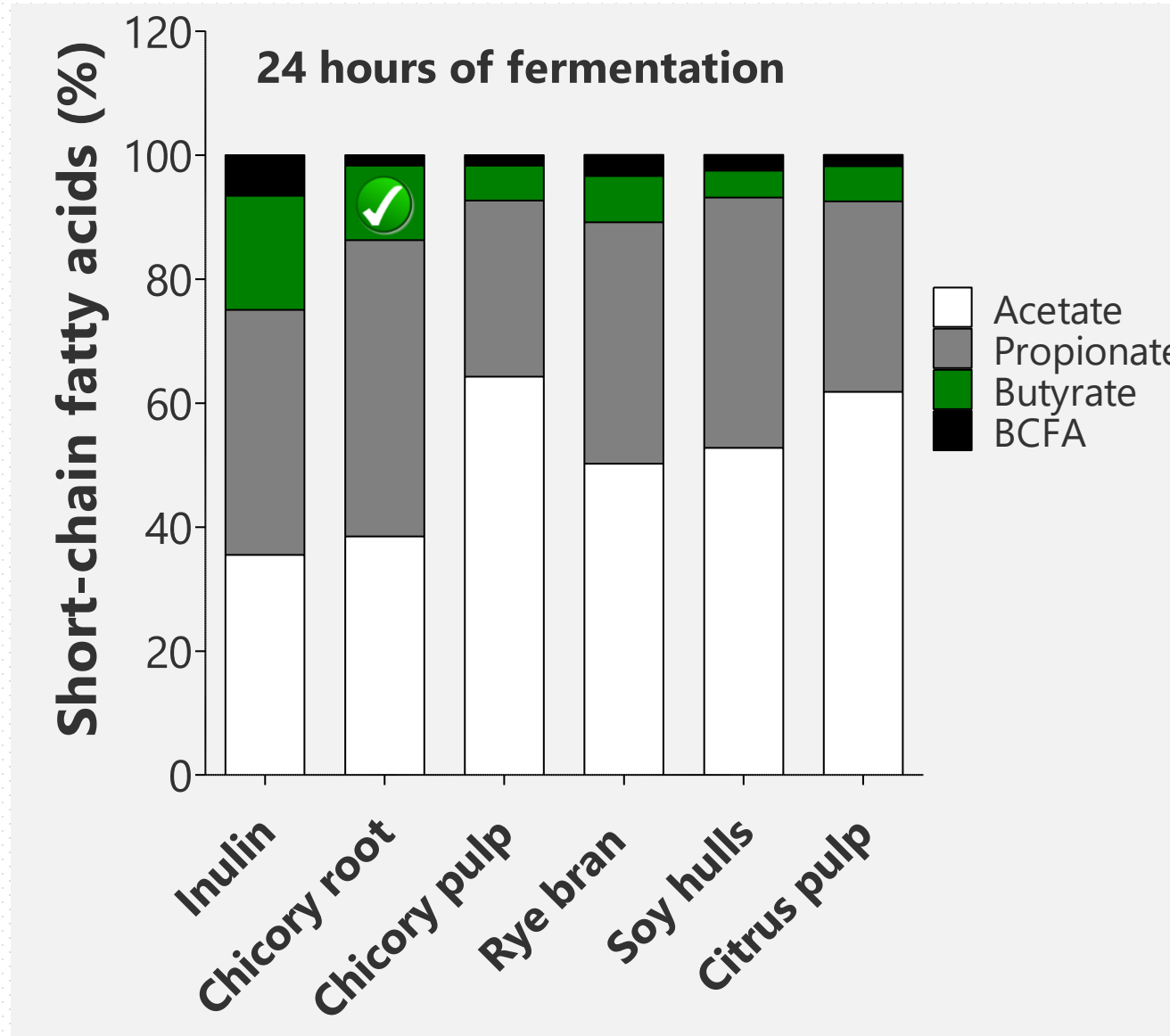
Metabolites



qPCR and **ELISA** of PBMC and IPEC-J2

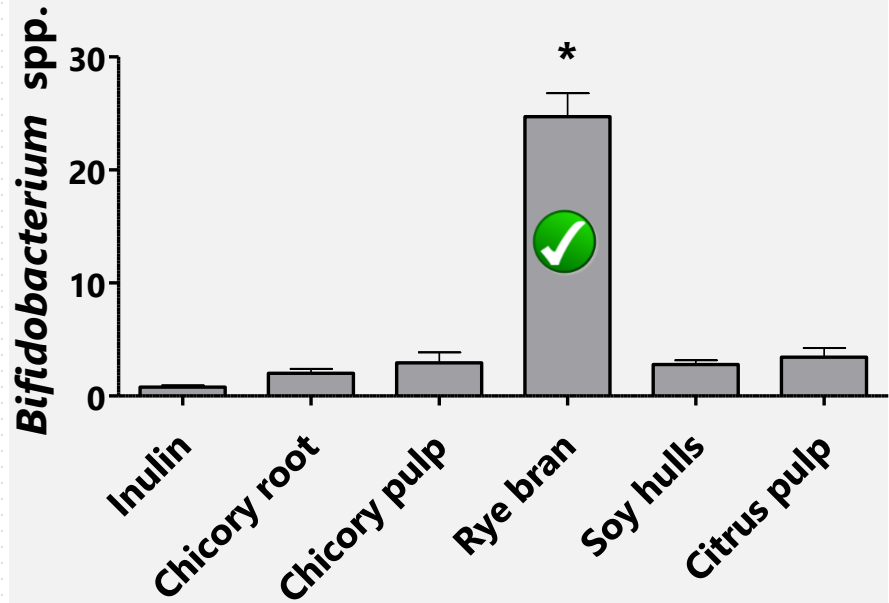
Intestinal
barrier

METABOLITES

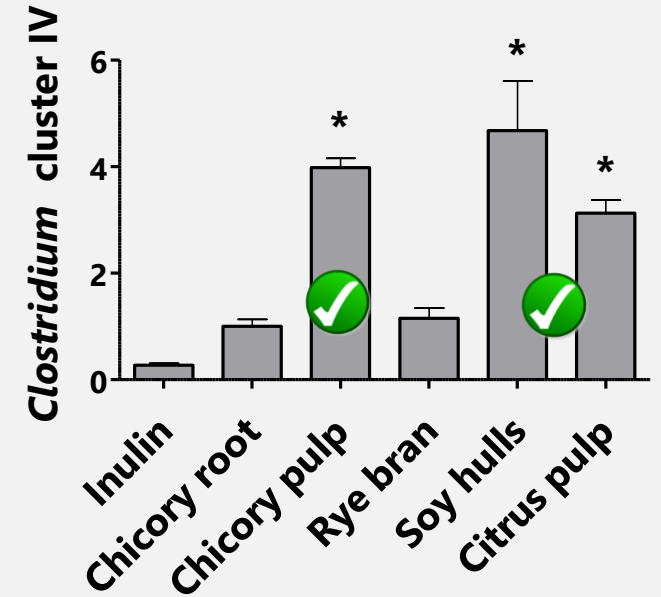
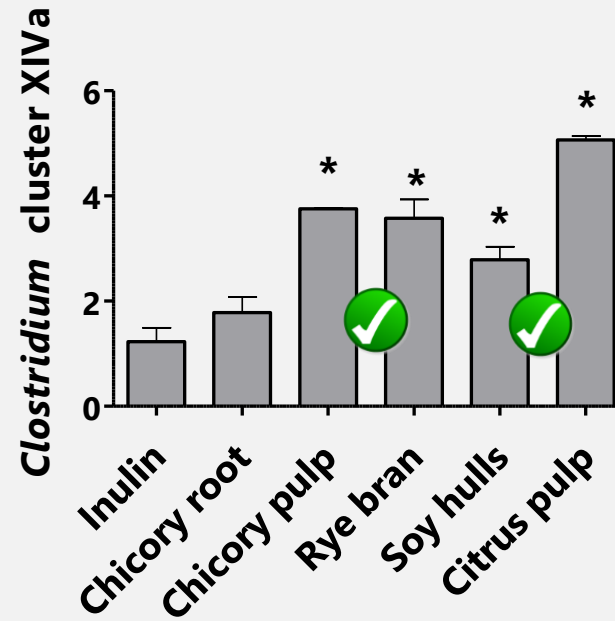


MICROBIOTA

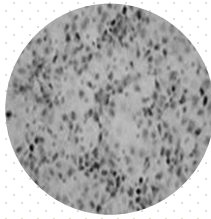
Acetate producer



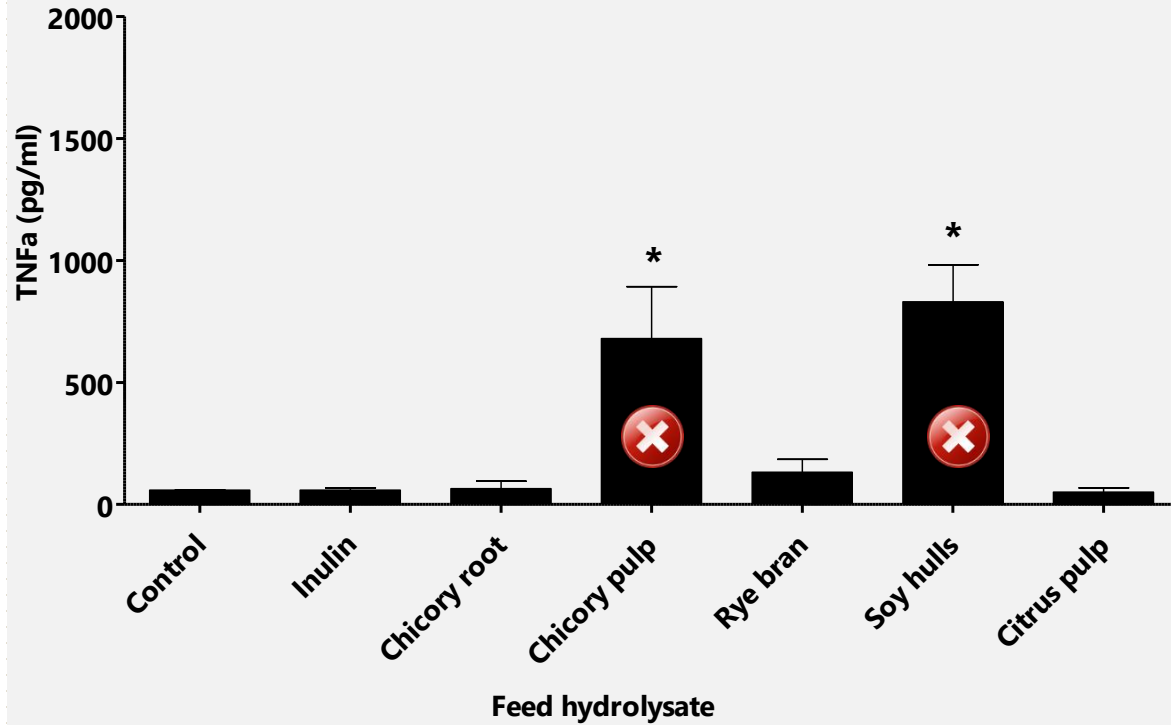
Butyrate producers



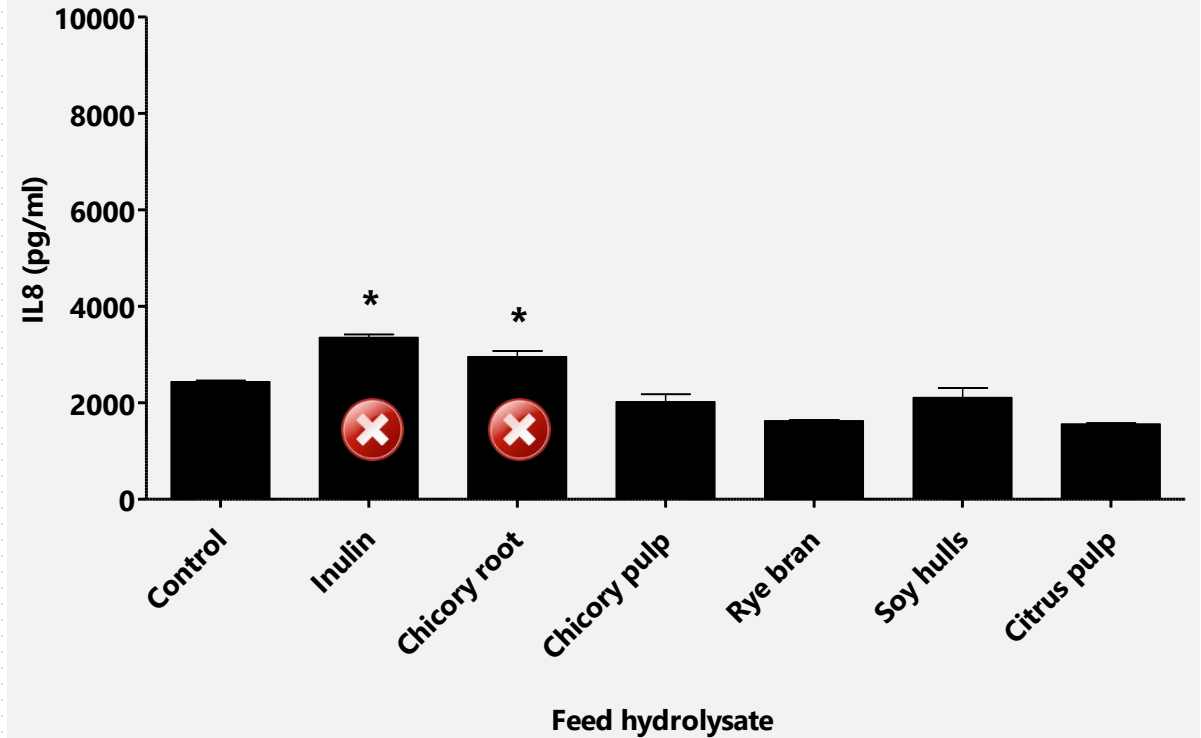
INTESTINAL INFLAMMATION (PBMC)



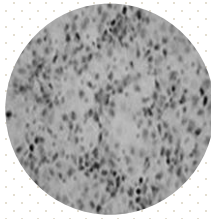
Feed effect - TNFa



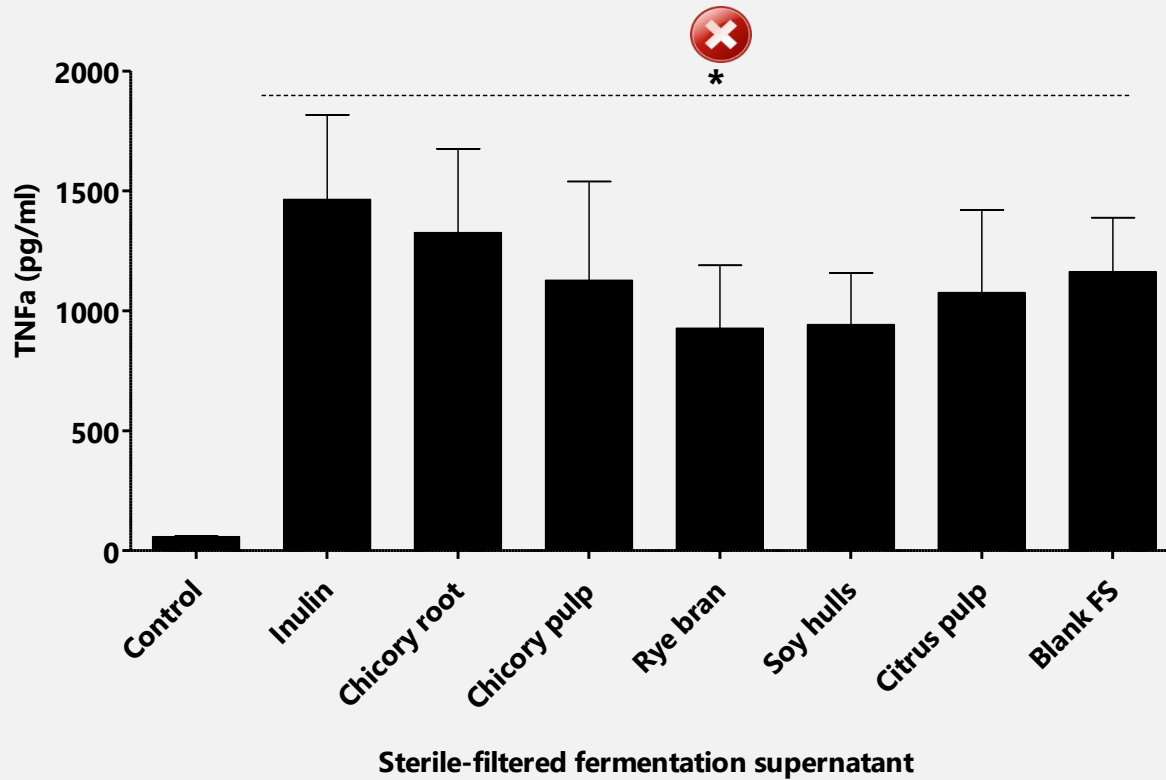
Feed effect - IL8



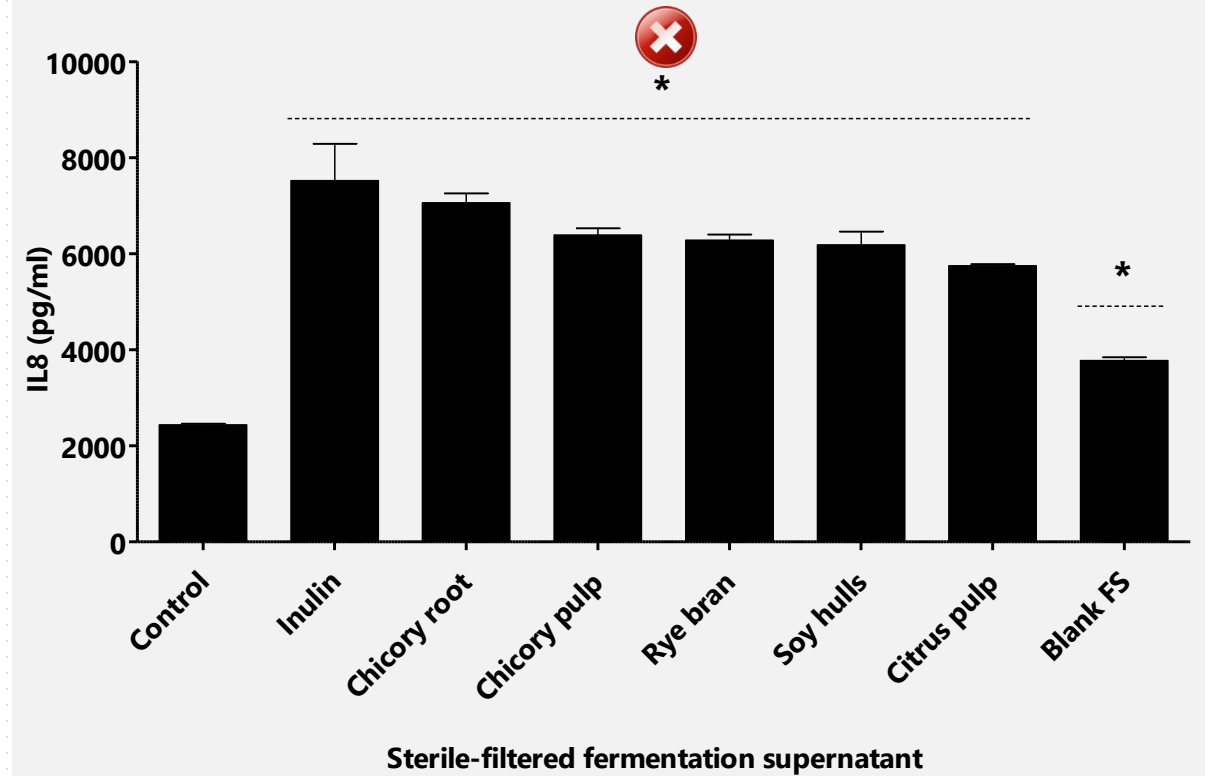
INTESTINAL INFLAMMATION (PBMC)



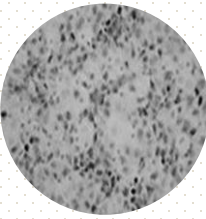
Metabolites effect – TNFa



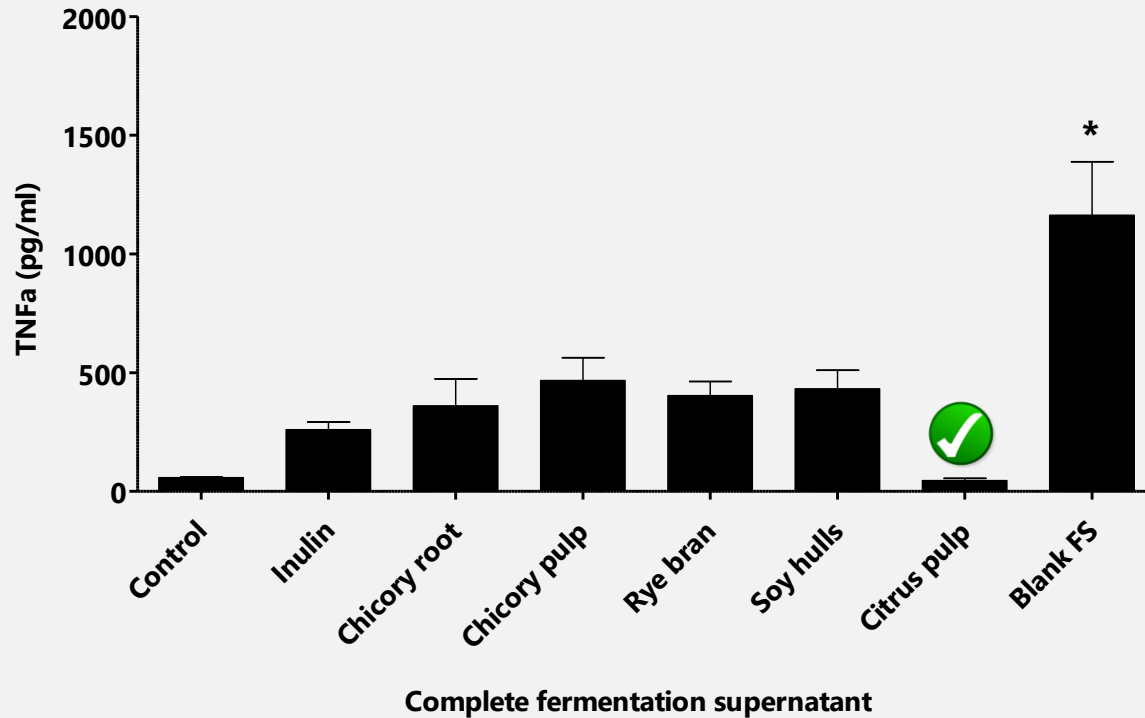
Metabolites effect – IL8



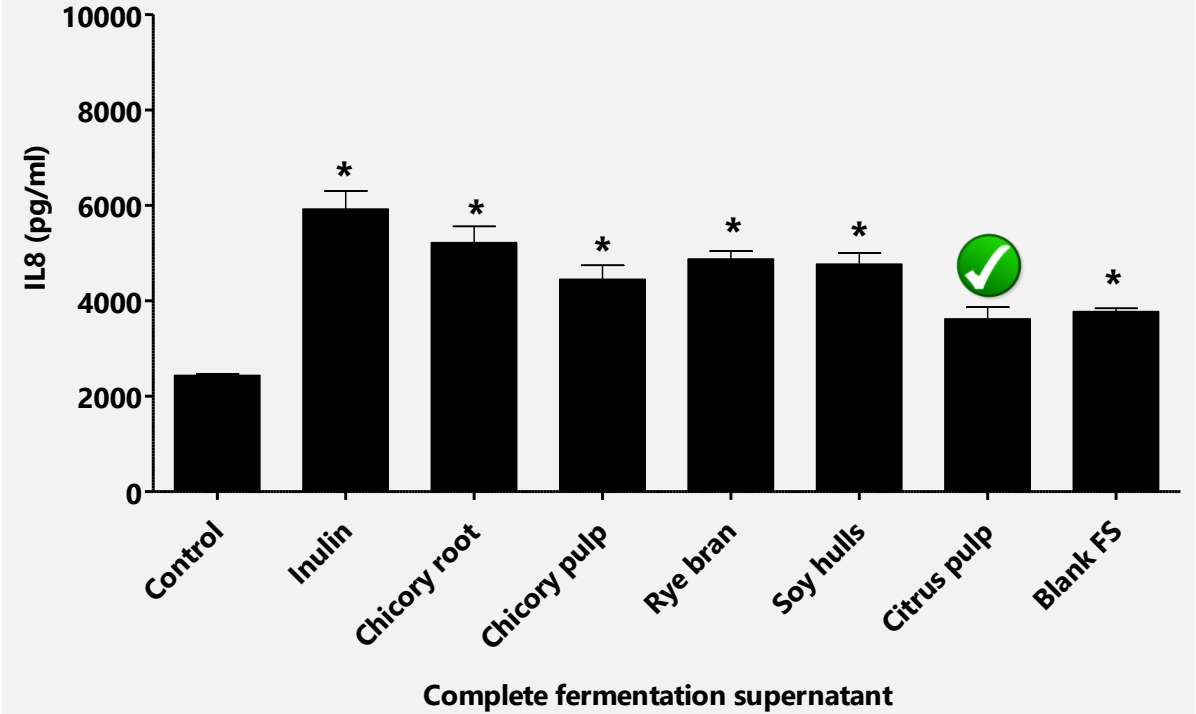
INTESTINAL INFLAMMATION (PBMC)



Metabolites & Microbiota effects - TNFa



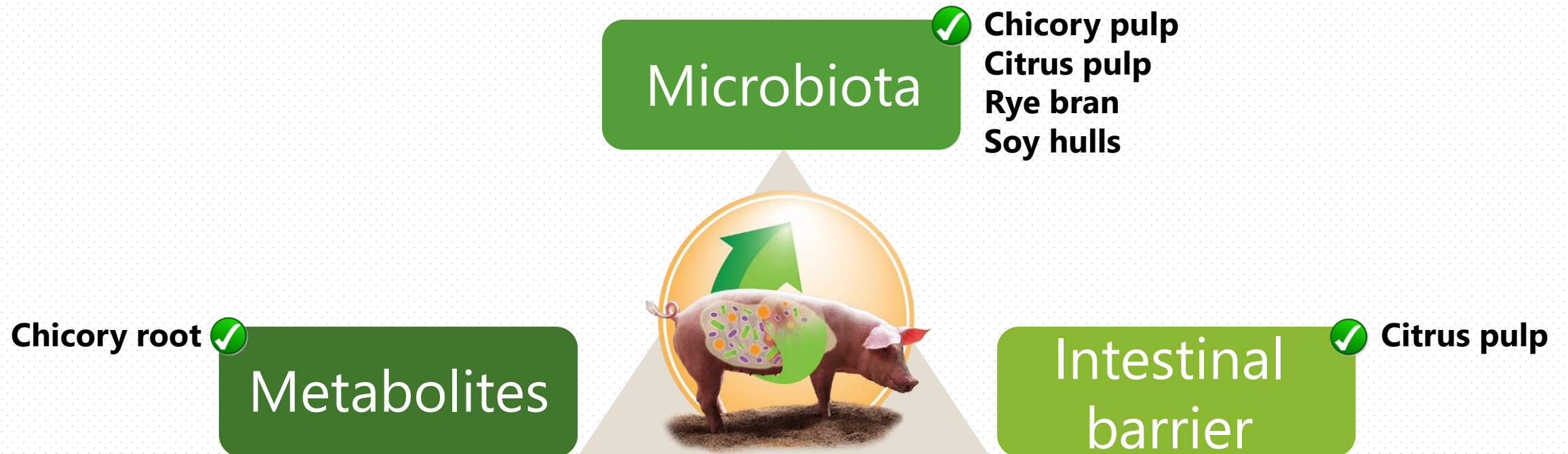
Metabolites & Microbiota effects - IL8



CONCLUSION

Necessity to study the interplay between the **metabolites**, **microbiota** and **intestinal barrier**

» Implementation of a **new approach** combining an ***in vitro* batch fermentation** to **cell cultures**

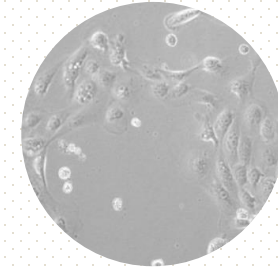


PERSPECTIVES

Intestinal
barrier



Barrier integrity (IPEC-J2 cell line)



In vivo trials



**Metabolites
Microbiota
Inflammation
Barrier function**

Intestinal
barrier

THANK YOU

