

# Impact of high-wheat bran diet on sows' microbiota, performances and progeny's growth and health

*J. Leblois<sup>1,2\*</sup>, J. Bindelle<sup>2</sup>, F. Dehareng<sup>3</sup>, S. Massart<sup>2</sup>, B. Li<sup>2</sup>, H. Soyeurt<sup>2</sup>,  
Y. Beckers<sup>2</sup>, J. Wavreille<sup>3</sup>, N. Everaert<sup>2</sup>*

*<sup>1</sup> FRIA-FNRS, Fonds de la Recherche Scientifique, Rue d'Egmont, 5. 1000 Brussels, Belgium*

*<sup>2</sup>GxABT, ULg, Passage des Déportés, 2. B-5030 Gembloux, Belgium*

*<sup>3</sup>Walloon Agricultural Research Centre, Rue de Liroux, 9. B-5030 Gembloux, Belgium*

# Objective



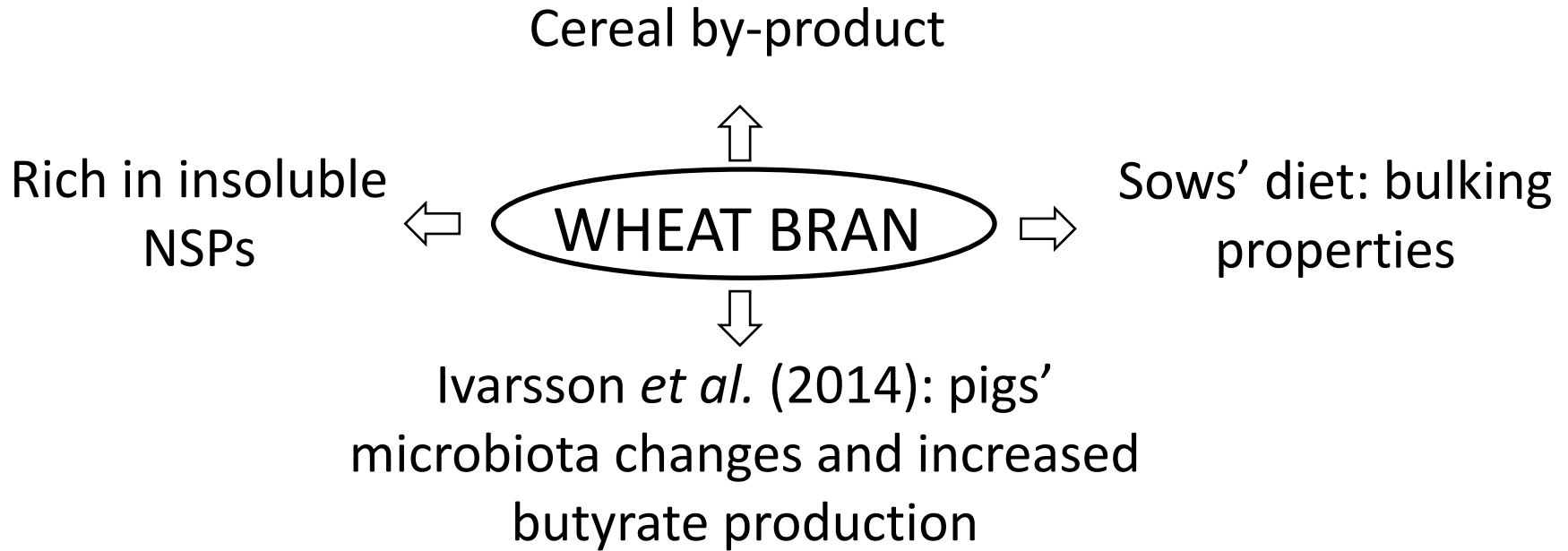
Improve piglets' health  
without using antibiotics

HOW?

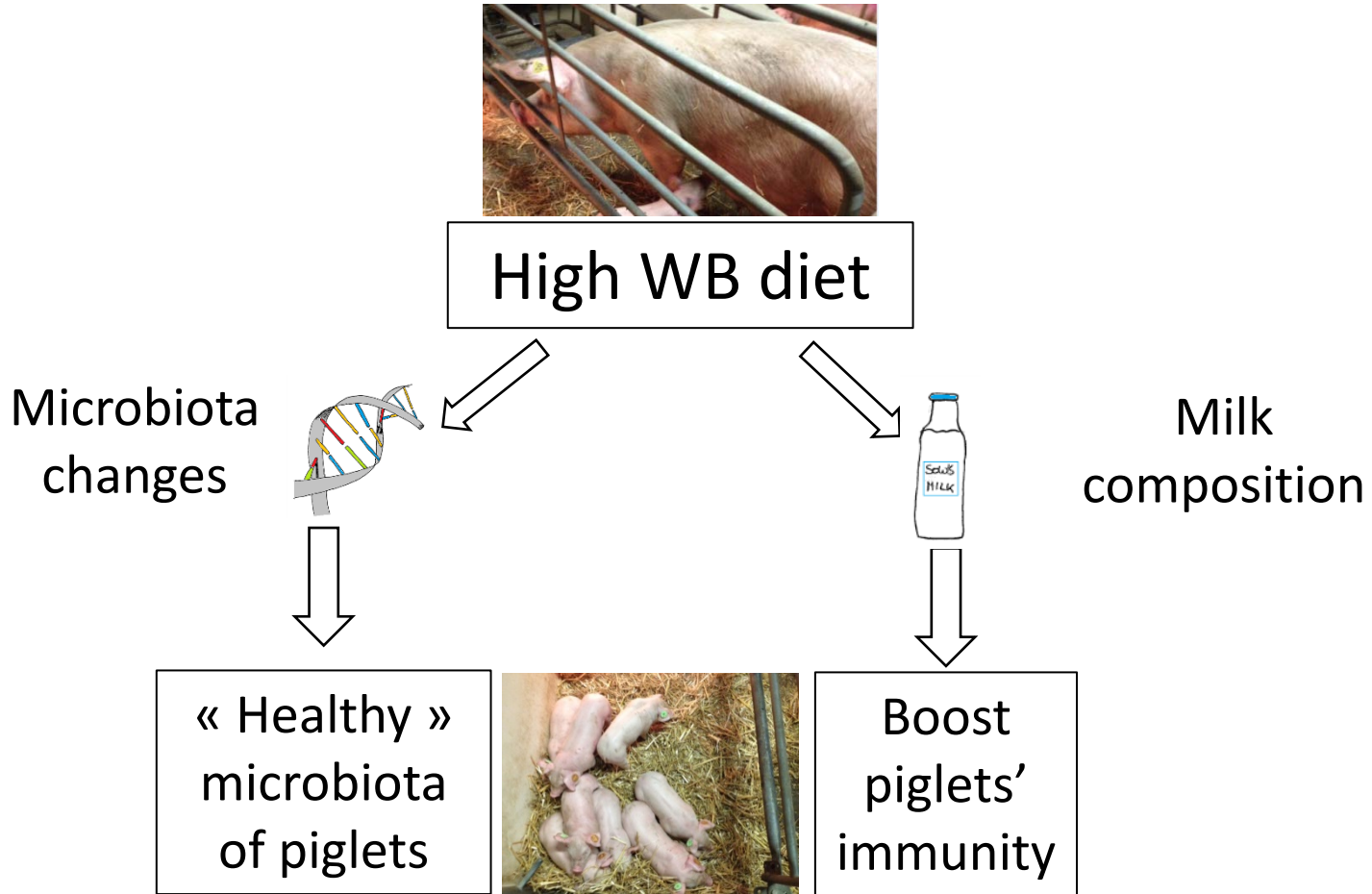


Acting on **SOWS' diet**  
→ Use of high quantities  
of wheat bran (**WB**)

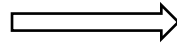
# Objective



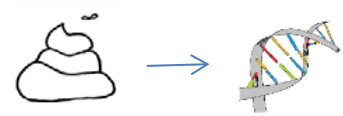
# Hypothesis



# Methods



ELISA, mid-infrared



Sequencing

7 CON sows & 8 WB sows

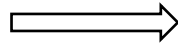


Gestation

240g/kg DM WB

Lactation

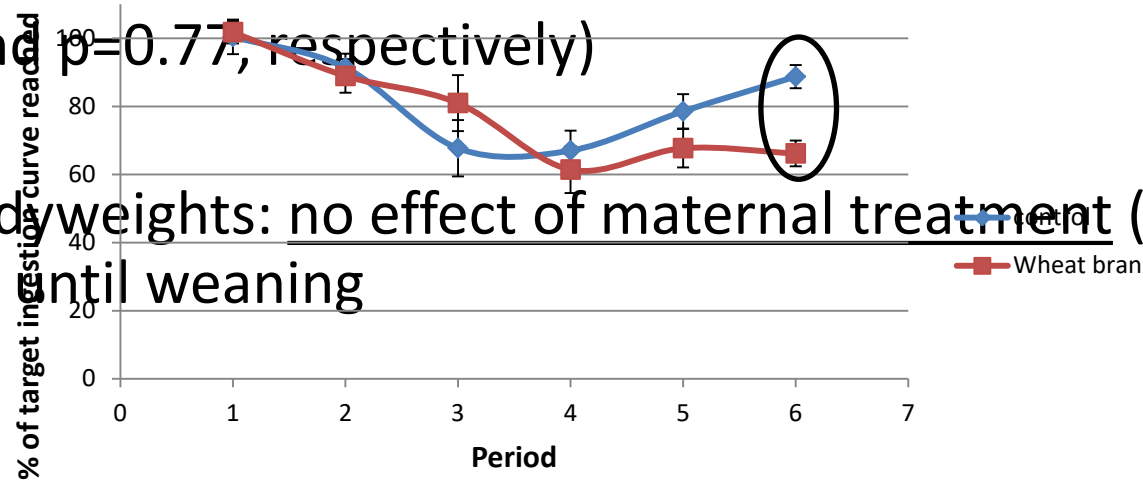
140g/kg DM WB



SCFA  
Sequencing

# Results: performances

- Backfat/bodyweight changes: no impact of treatment (p=0.60 and p=0.77, respectively)

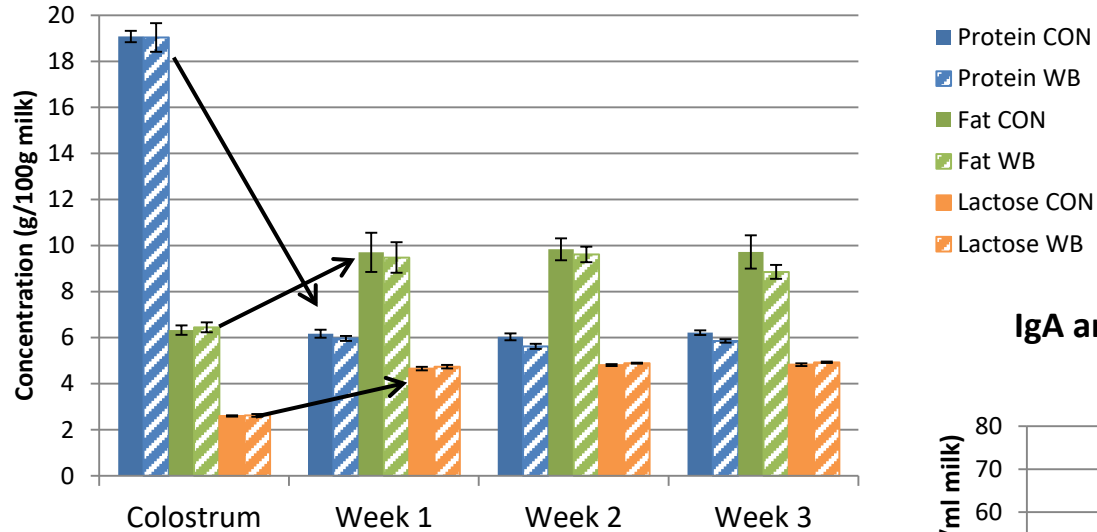


- Litters' bodyweights: no effect of maternal treatment (p=0.51) from birth until weaning

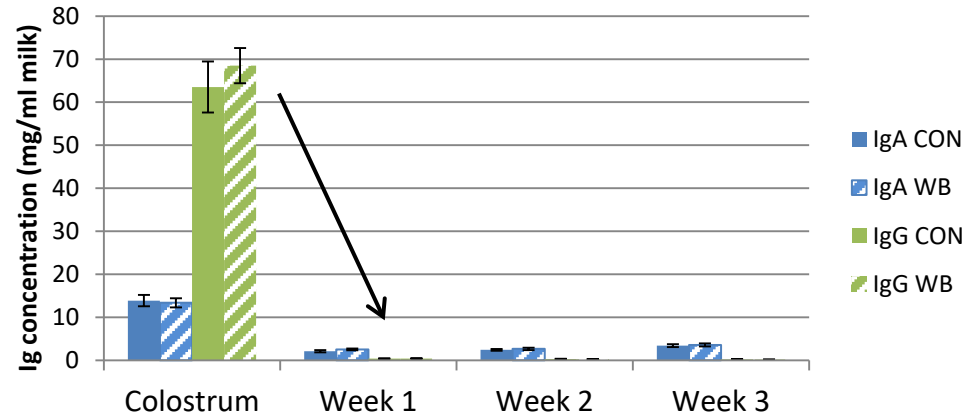
- Ingestion of both groups similar except for the **last 4 days** of the lactation period (drop in WB ingestion), 66% of their planned feed intake-curve WB group vs 89% CON group

# Results: milk composition

## Chemical composition of milk at different time points

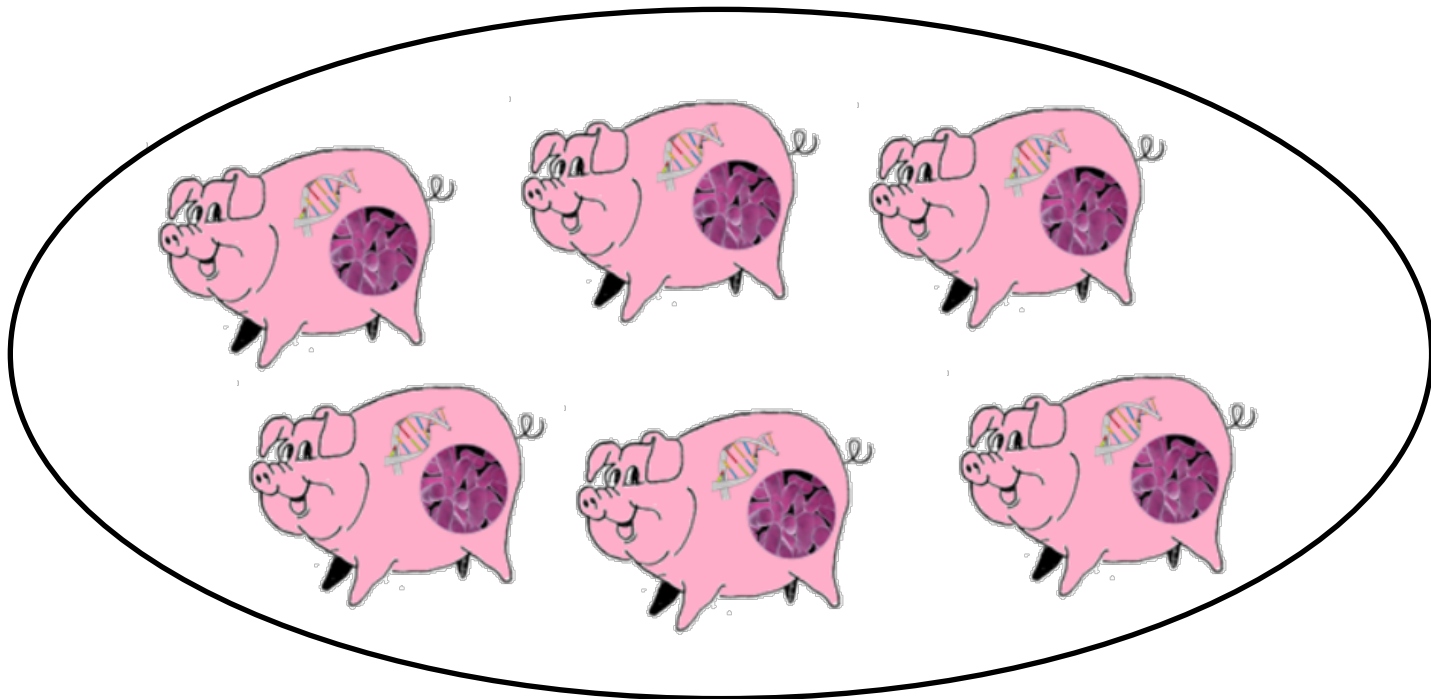


## IgA and IgG concentrations of sow milk at different time points



# Results: MICROBIOTA

## THE BIG PICTURE...



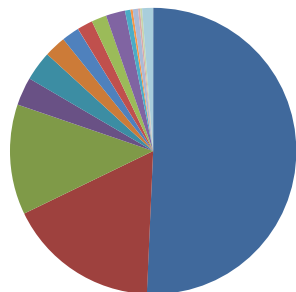


Gestation BEFORE diet  
change (**G-**)

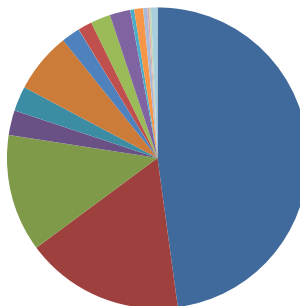
Gestation AFTER diet  
change (**G+**)

Lactation (**L**)

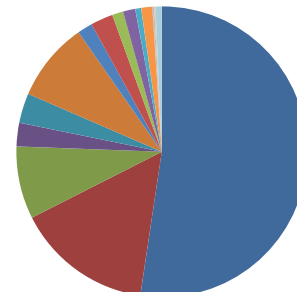
CON G-



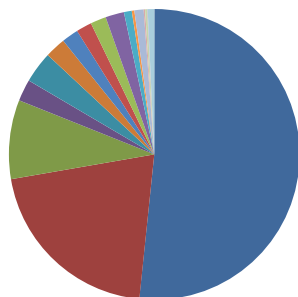
CON G+



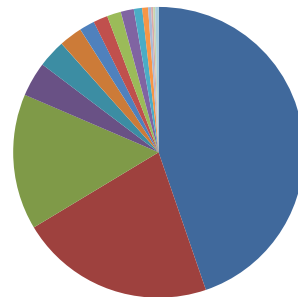
CON L



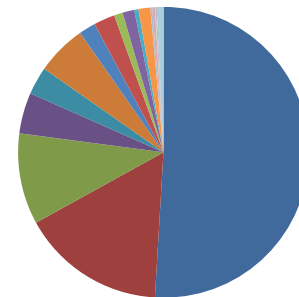
WB G-



WB G+



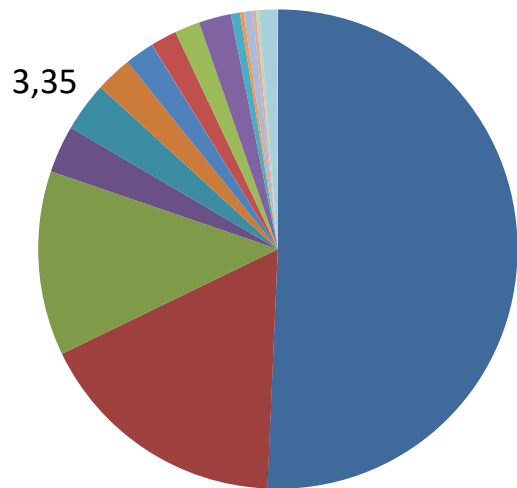
WB L



- Lactobacillus
- Treponema
- Phascolarctobacterium
- Streptococcus
- Oscillospira
- Ruminococcus
- Clostridium
- CF231
- Faecalibacterium
- Megasphaera
- Bifidobacterium
- Fibrobacter
- Roseburia
- Butyrivibrio
- Parabacteroides

# CONTROL GROUP

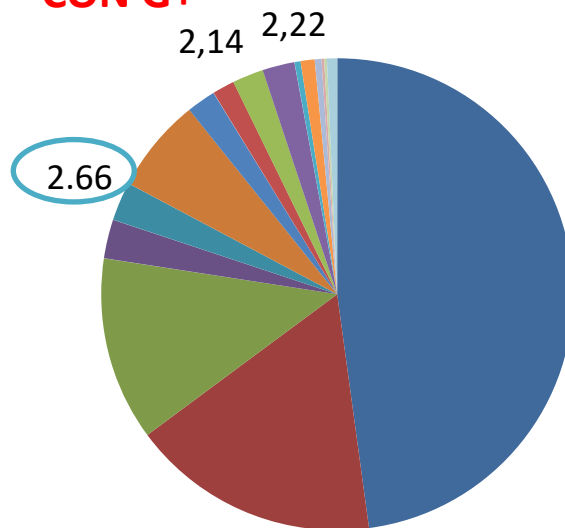
**CON G-**



■ Phascolarctobacterium

3.35% → 2.66%

**CON G+**



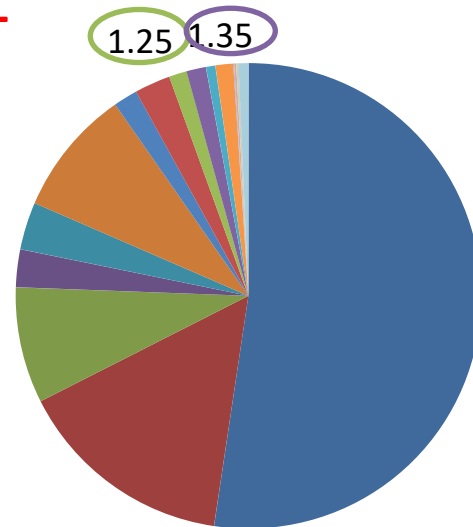
■ Clostridium

■ CF231

■ Bifidobacterium

■ Butyrivibrio

**CON L**



2.14% → 1.25%

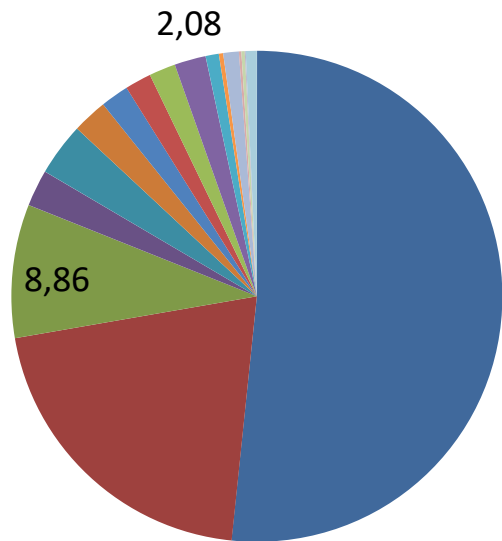
2.22% → 1.35%

Anecdotal

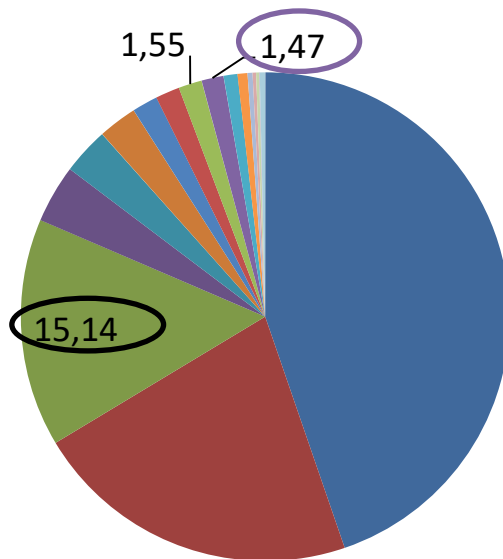
Anecdotal

# WHEAT BRAN GROUP

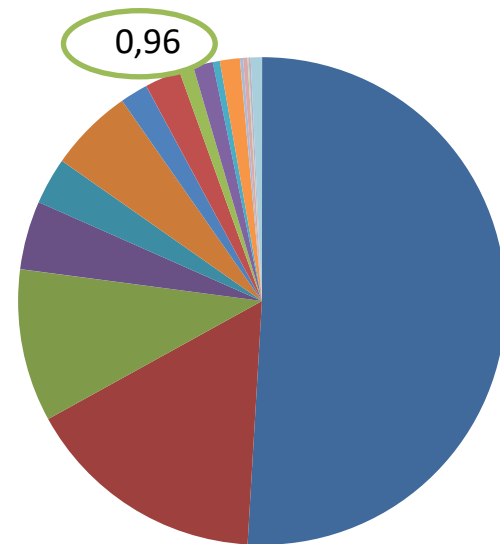
WB G-



WB G+



WB L

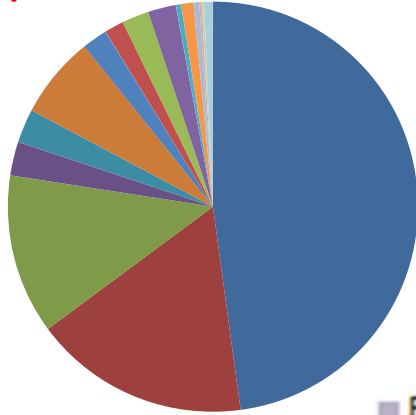


■ Lactobacillus 8.86% → 15.14%  
■ CF231 2.08% → 1.47%

■ Clostridium 1.55% → 0.96%

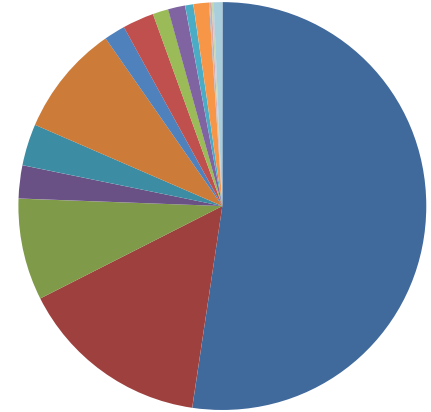
# TREATMENT DIFFERENCES - NS

**CON G+**



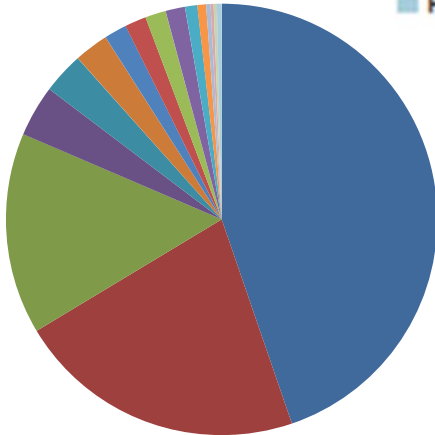
**Gestation**

**CON L**

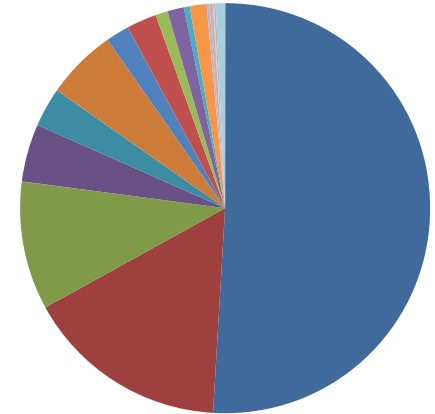


**Lactation**

**WB G+**



**WB L**

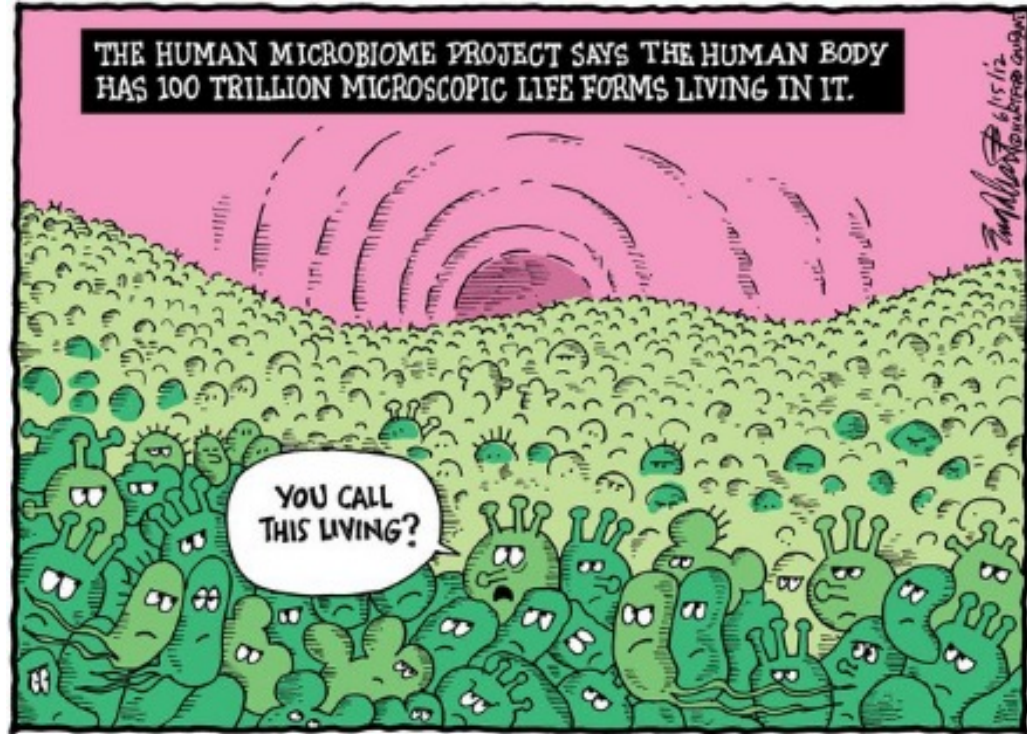


■ Butyrivibrio

■ Parabacteroides

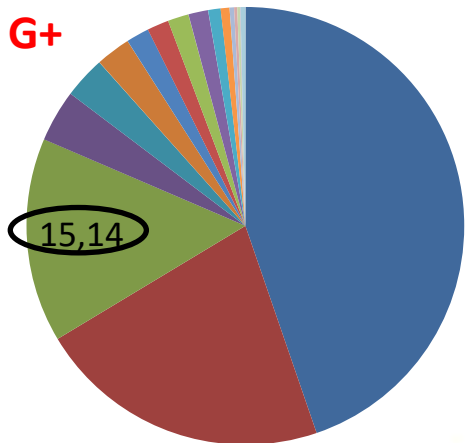
# Results: MICROBIOTA

## AND THE DETAIL...



(Duke University student affairs)

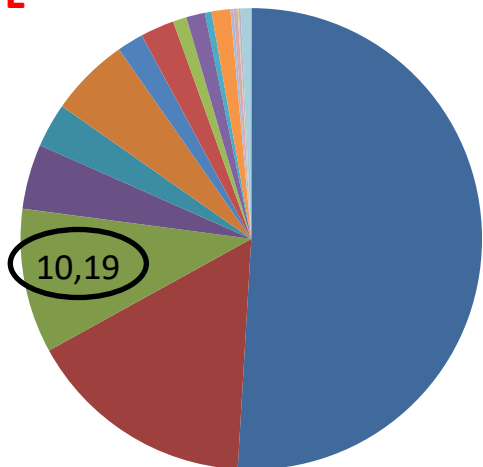
**WB G+**



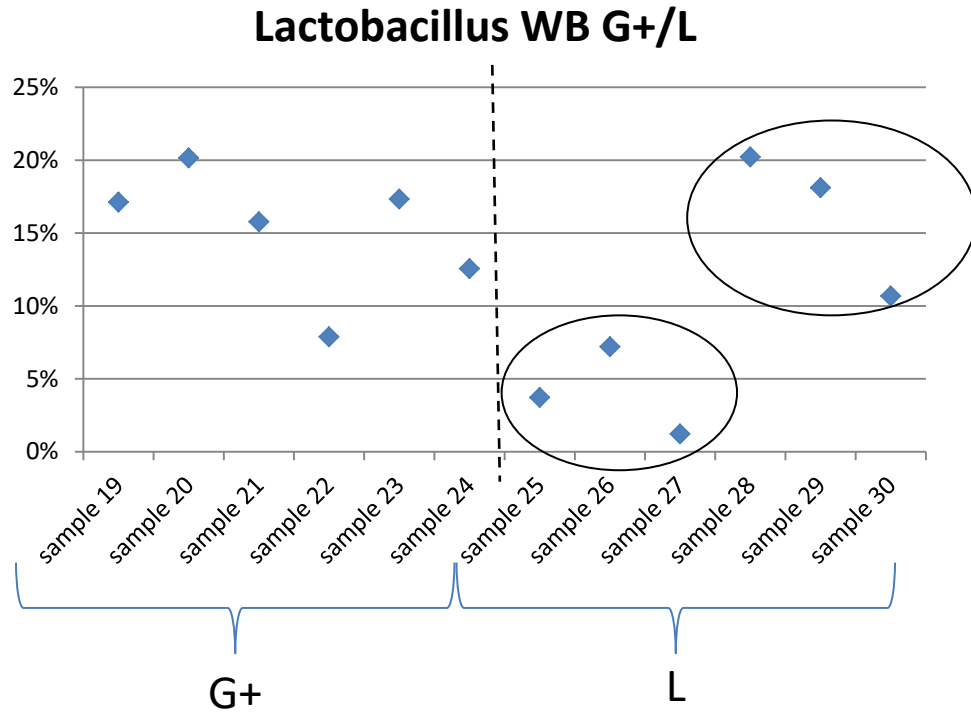
**Lactobacillus**

15% → 10%

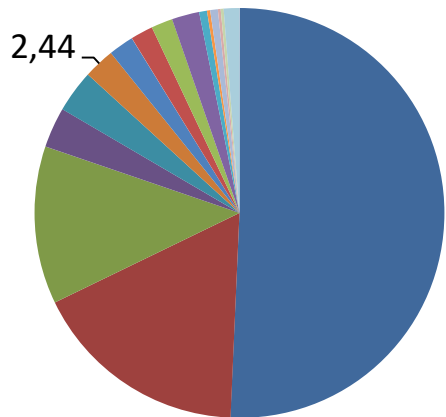
**WB L**



**NS**



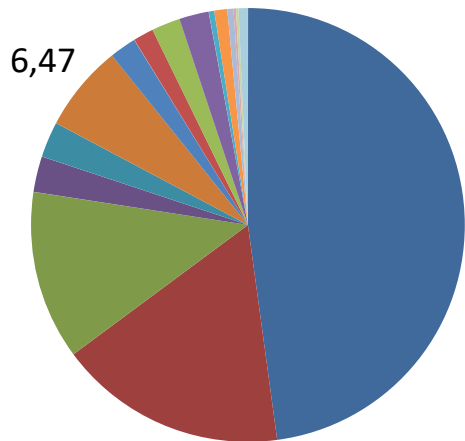
**CON G-**



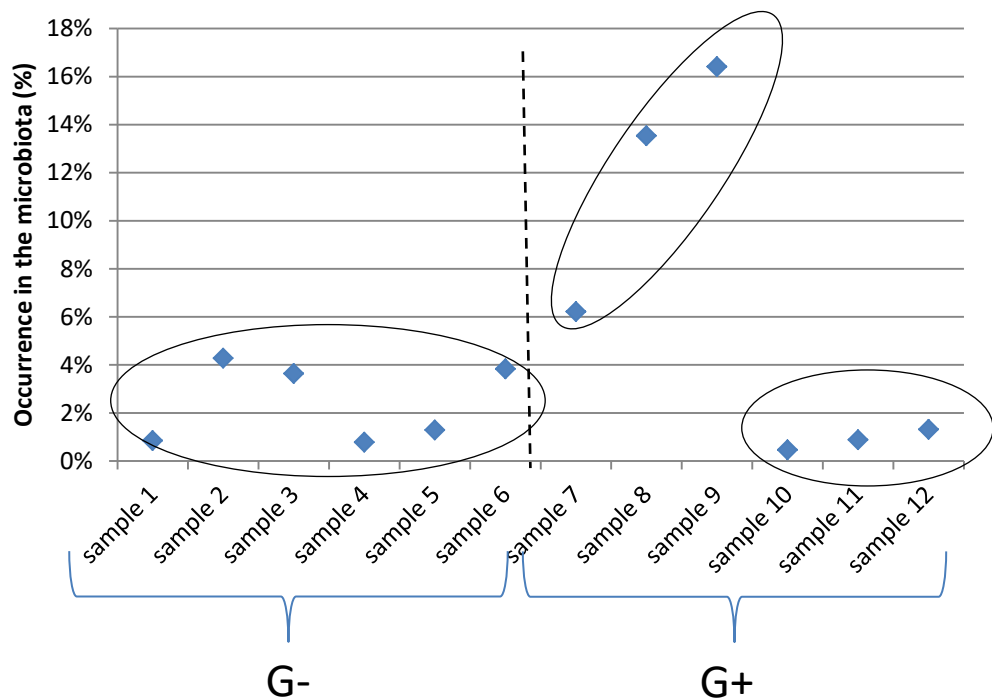
**Streptococcus**

**CON G+**

NS



### Streptococcus CON G-/G+



# Conclusion

- No impact of dietary treatment on **performances** except for ingestion (last period)
  - No impact on **milk** composition
- ➔ Increasing WB proportion is not detrimental
- Conclusions concerning **microbiota** hard to draw due to high variability between individuals



# Next step

- Microbiota and short-chain fatty acids (**SCFA**) of piglets
  - Related to sows?
  - Microbiota vs SCFA correlation?
  - Less variability for piglets' microbiota?

# Acknowledgments

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[Julie.leblois@ulg.ac.be](mailto:Julie.leblois@ulg.ac.be)