

# Sheep and cow milk differentially modify infant faecal bacteria

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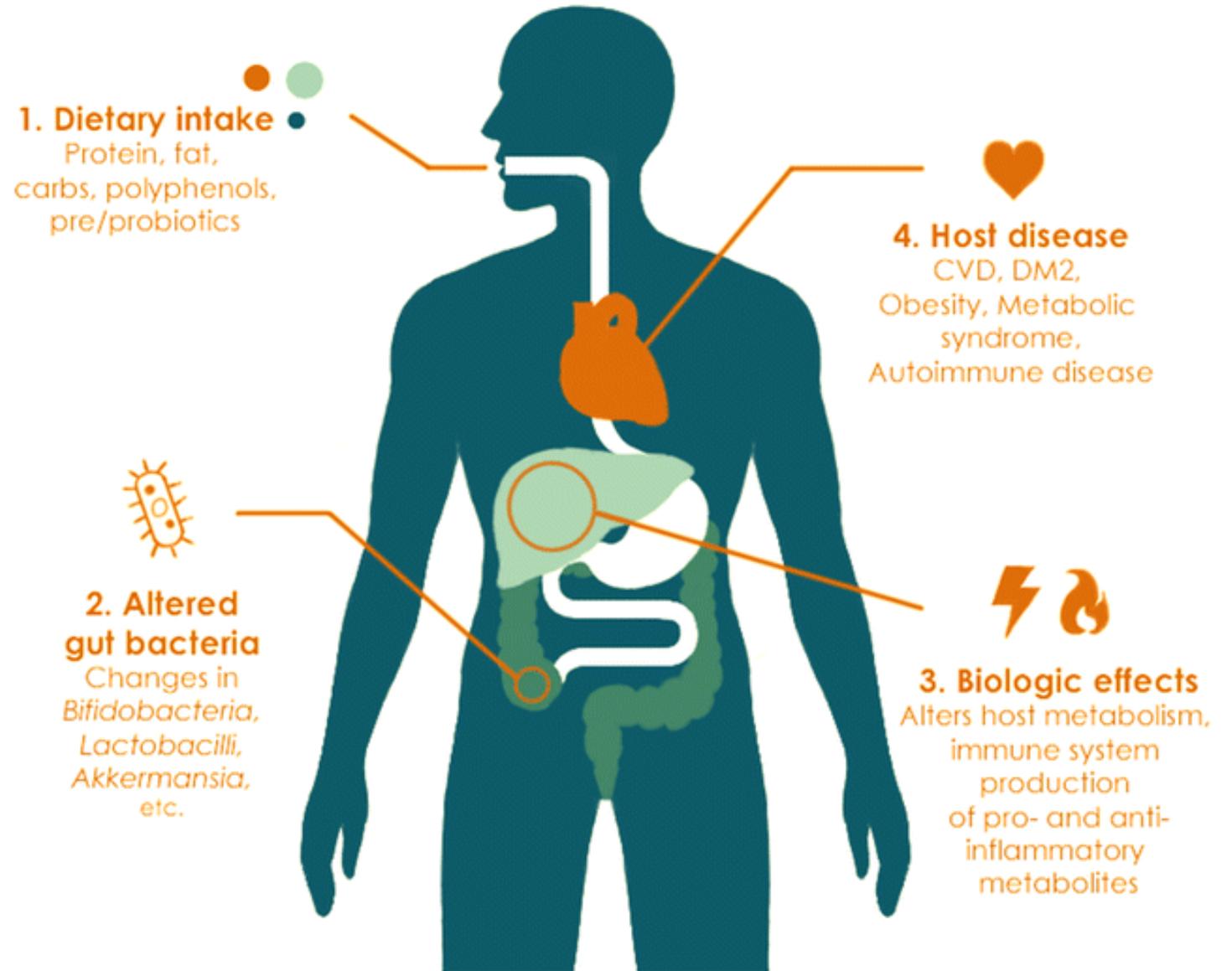
**ag**research  
*āta mātai, mātai whetū*



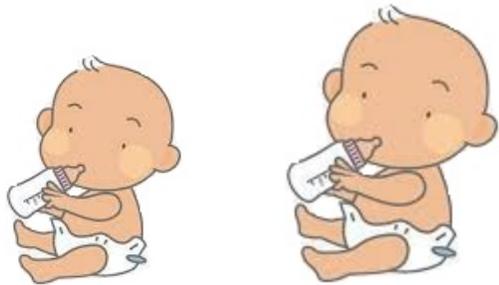
## Differences in milks – different enough?

	Cow milk	Sheep milk	Sheep milk vs. cow milk
Total solids (%)	13	18	+ 39 %
Fat (%)	3.6	7.9	+ 119 %
Protein (%)	3.2	6.2	+ 94 %
- Casein (%)	2.7	4.2	+ 56 %
- Whey (%)	0.6	1.0	+ 67 %
Lactose (%)	4.7	4.9	+ 4 %
Calcium (mg/100g)	112.0	197.5	+ 76 %
Magnesium (mg/100g)	11.0	19.5	+ 77 %
Phosphorus (mg/100g)	91.0	141.0	+ 56 %
Vitamin C (mg/100g)	1.0	4.6	+ 360 %

# Gut microbiome: small bugs, big effects



# Simulating digestion



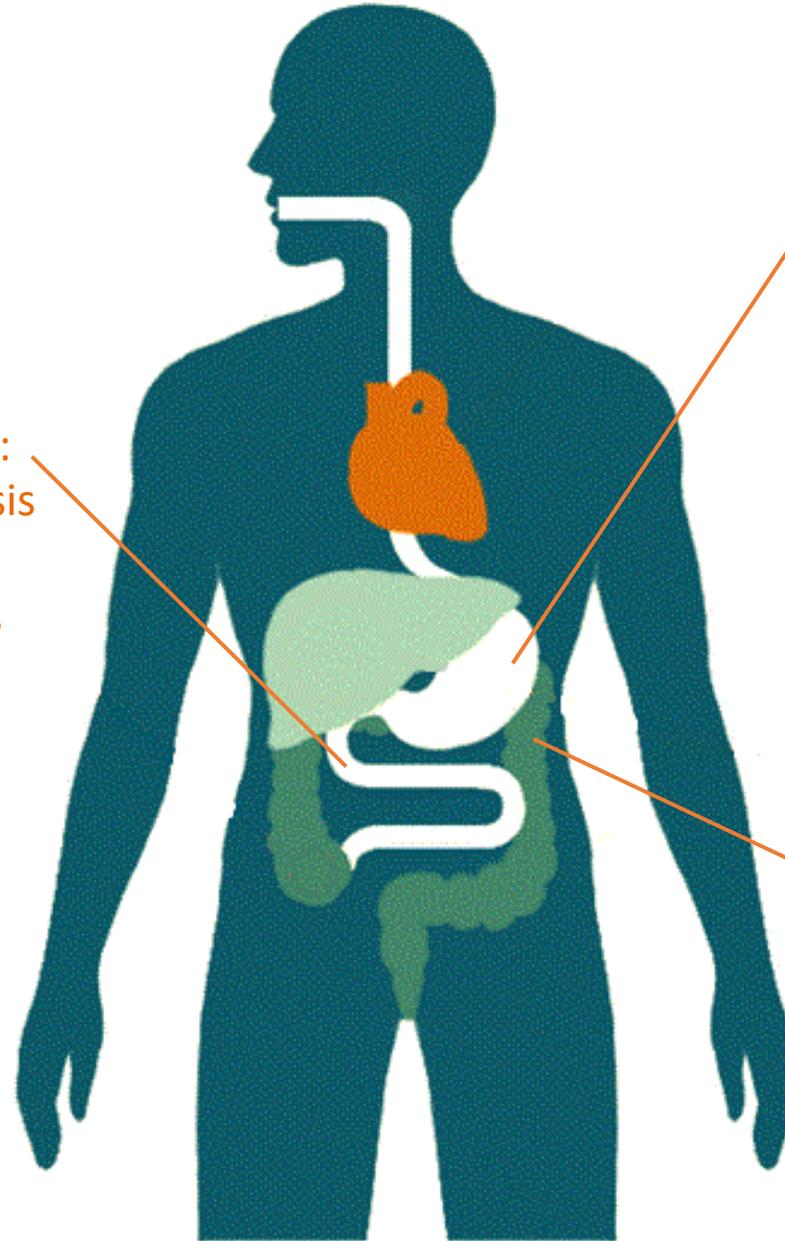
1 month old baby

5 month old baby

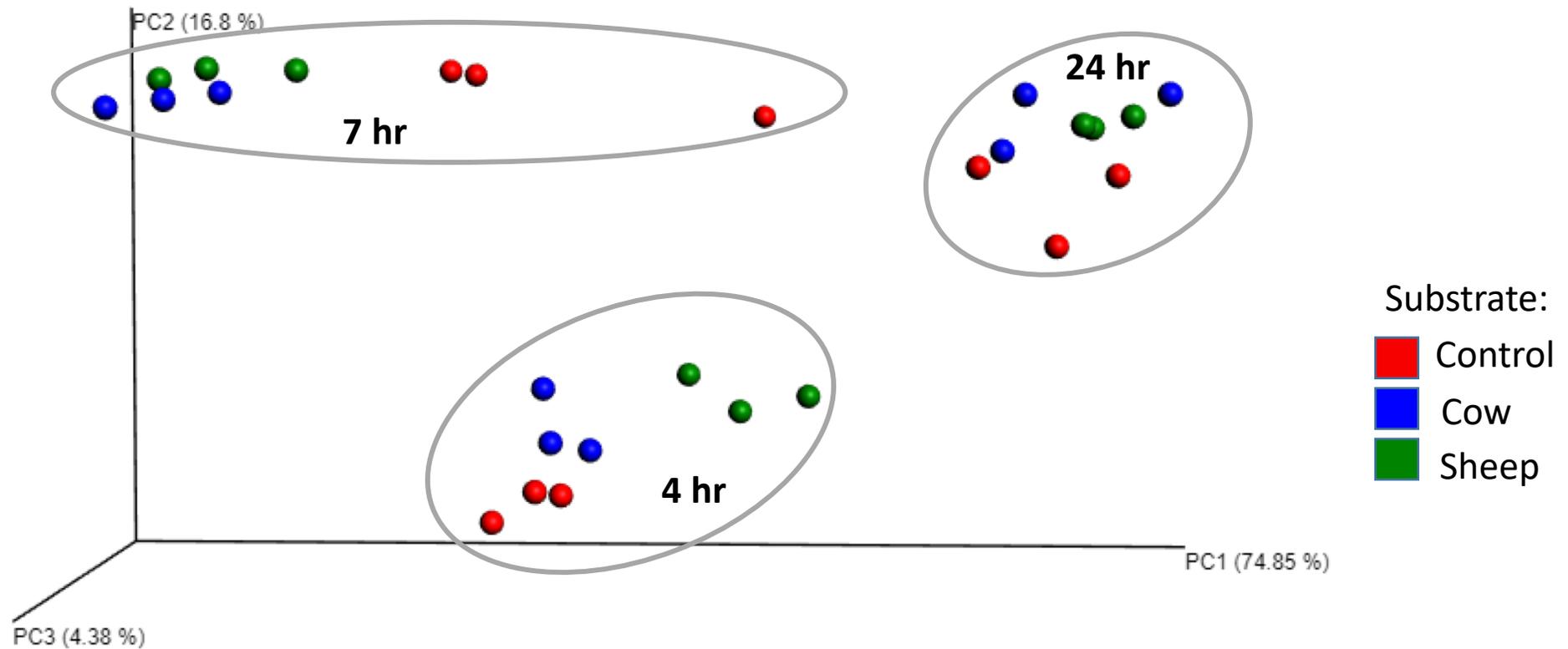
**2. Small intestine:**  
Digests into dialysis tubing  
→ 'digests' minus small molecules

**1. Stomach:**  
Milk combined with enzymes and simulated digestive fluids  
→ 'digests'

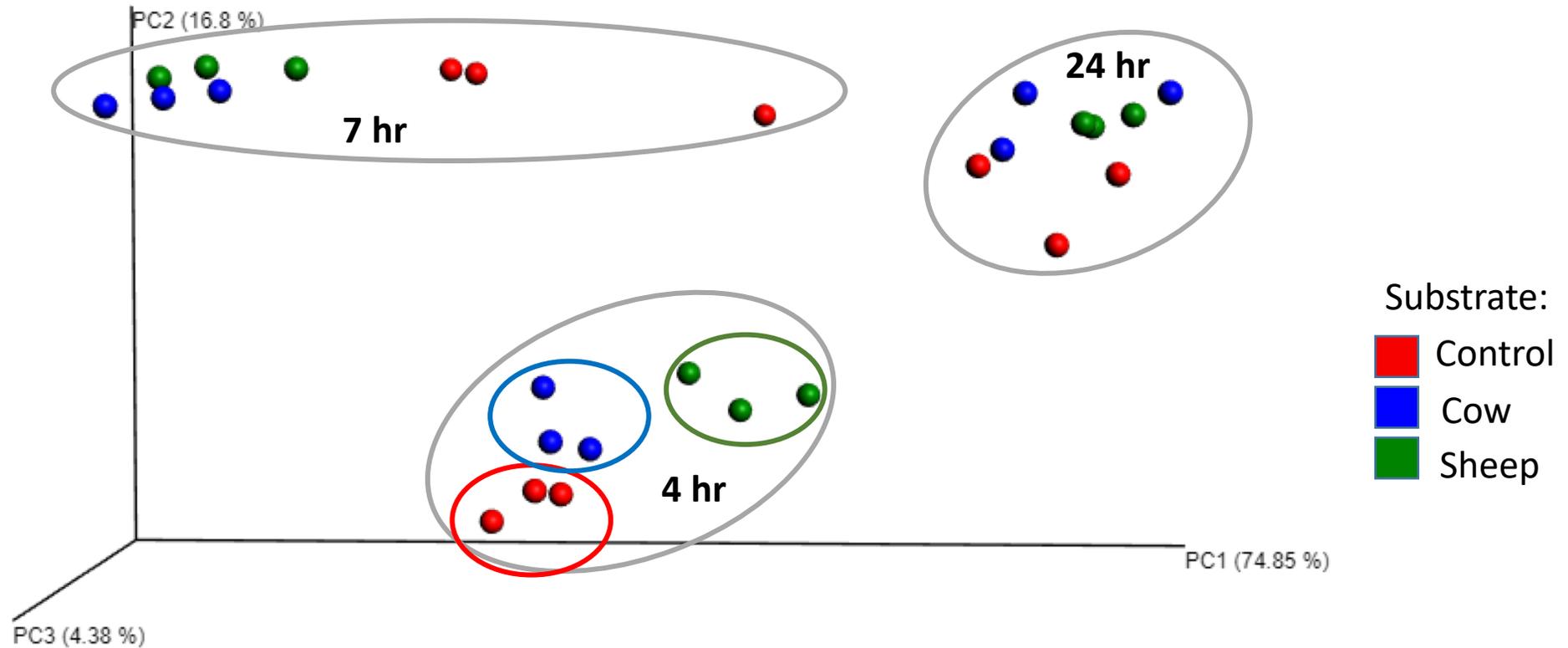
**3. Large intestine:**  
Fermentation of 'digests' in tubes, using bacteria from faeces  
→ samples at 4, 7 and 24 hours



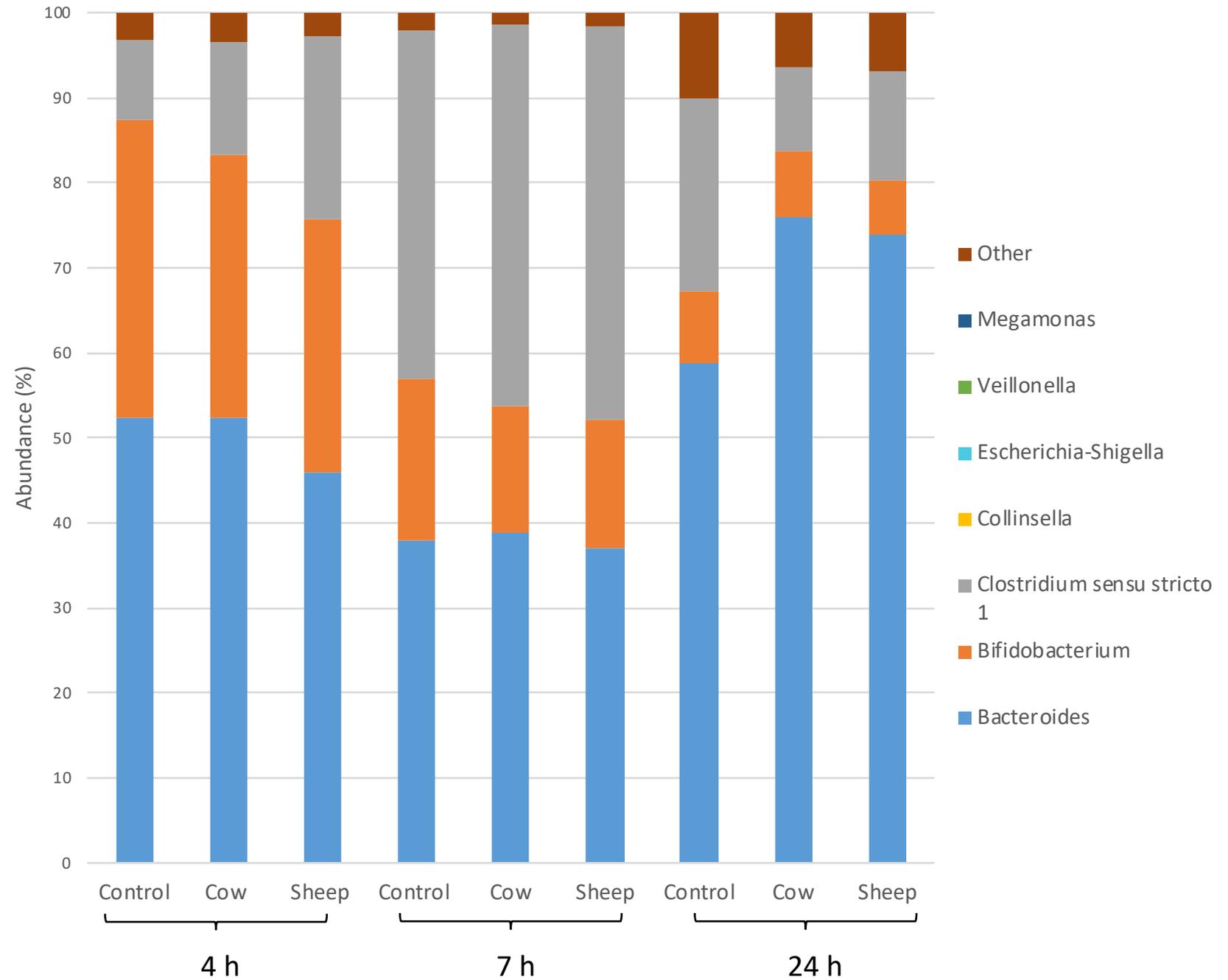
# Sheep and cow milk differentially modulate microbial composition: 1 month baby



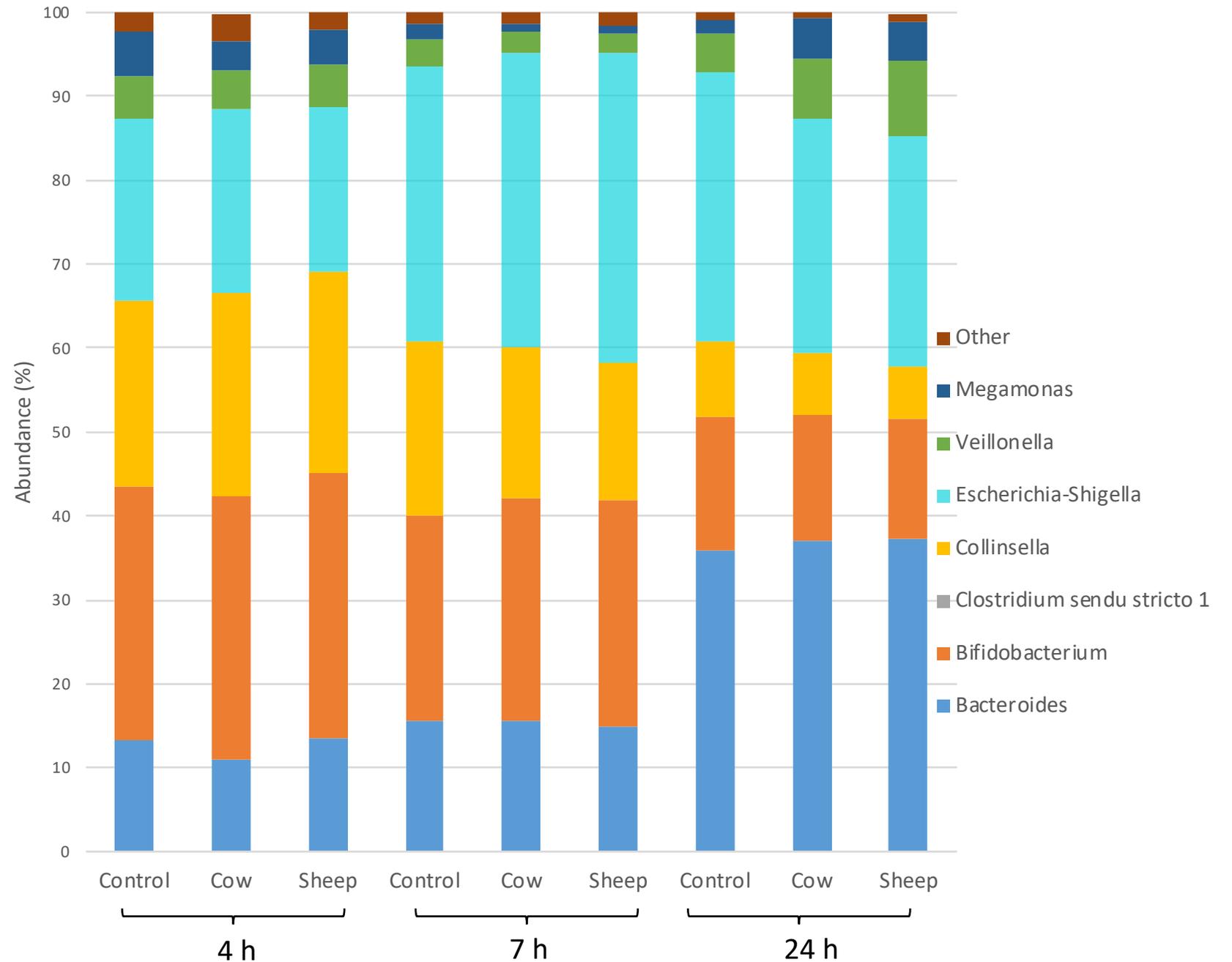
# Sheep and cow milk differentially modulate microbial composition: 1 month baby



# 1 month baby



# 5 month baby



# Are milk compositional differences enough to drive differences in gut microbiome?

Our *in vitro faecal* fermentation of sheep and cow milk showed:

- Significant differences in abundances of bacterial groups, driven by ‘feeding’ of different milks
- The specificity of the gut microbiome to an individual
- The starter microbiome of each individual determines the extent of potential effects of sheep milk and cow milk

# Sheep milk and cow milk differentially modify infant faecal bacteria

- Sheep milk clearly affects the microbiome differently to cow milk
- Different milks may have the potential to affect health differently through modulation of the microbiome
- Future research: to determine health effects as a result of milk-driven gut microbiome modification?

MBIE programme:  
**‘Boosting exports of the emerging NZ dairy sheep industry’**



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