Effect of mixed microbial culture treatment on the nutritive value of coffee, green tea, and oolong tea residues and the effect of the fermented residues on *in vitro* rumen fermentation

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Introduction

- Nowadays, livestock farmers are facing the difficulties to acquire affordable feedstuff.
- Agricultural by-products are one of the solutions.
- However, these feed sources are usually of low quality

Coffee

Oolong tea

Green tea

- Annual world coffee production is 0.8 m tons (ICO, 2010)
- Annual world tea production is 2.9 m tons (FAO 2000)
- In Japan, beverage companies annually produce 0.1 m tons of tea & 0.2 m tons of coffee annually

- A large quantity of beverage by-product released into the environment

Causing economic & environment problems.

- Need effective utilization method

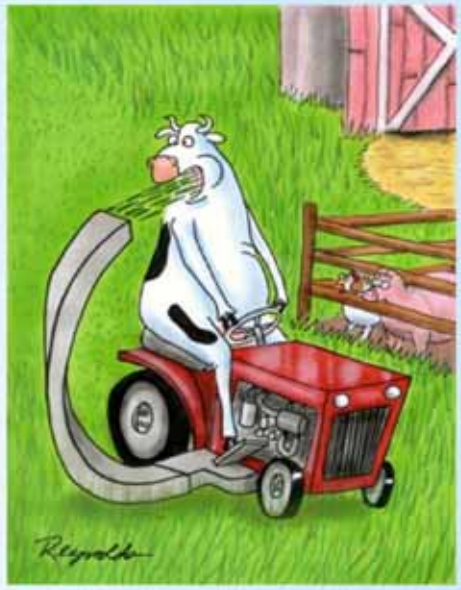
1.Animal feed 2.Compost 3.Bio-fuel

Objectives

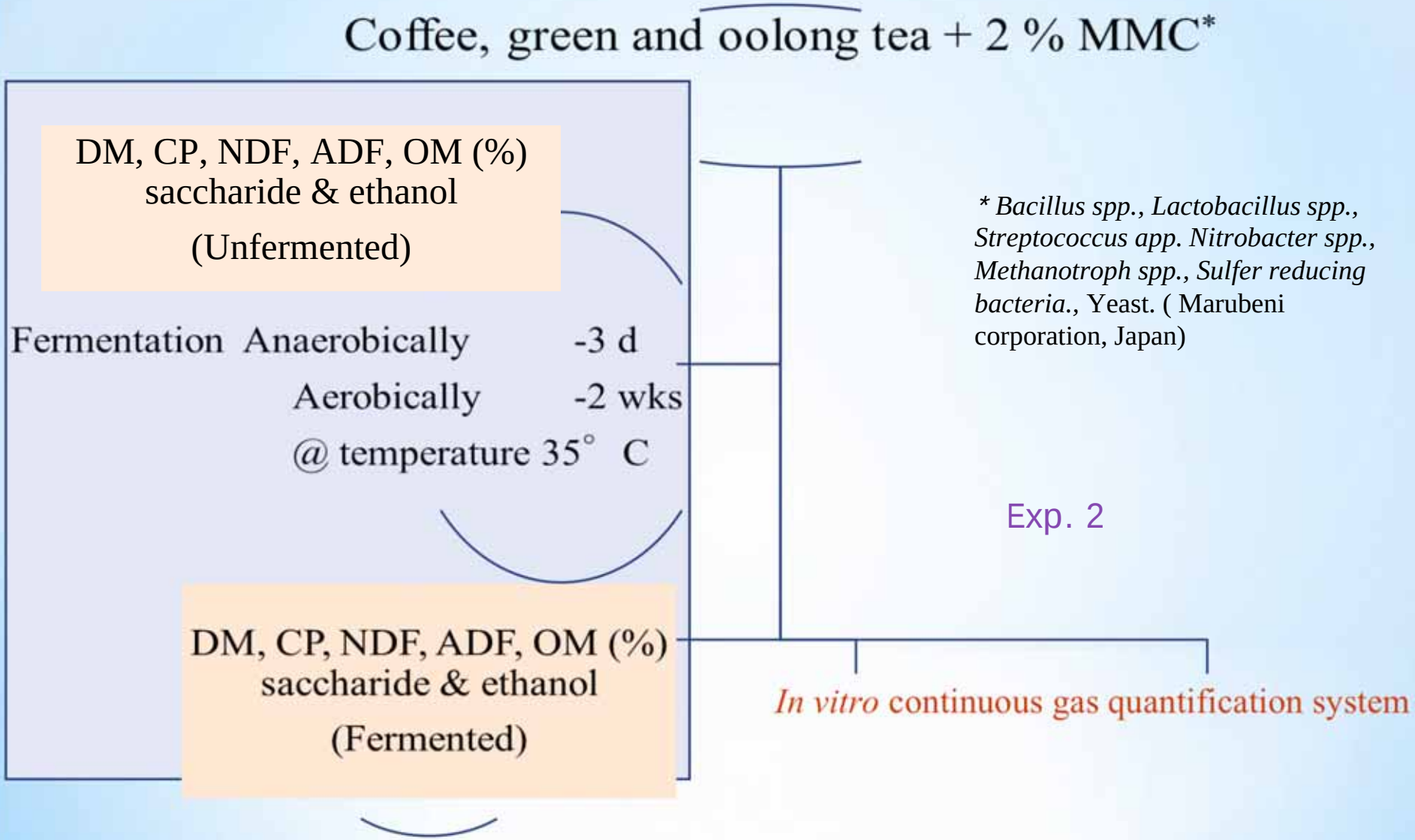
1. To evaluate the nutritive value of mixed microbial culture contained on coffee, green and oolong tea residues.

2. To measure *in vitro* methane production and other fermentation characteristics of fermented coffee, green and oolong tea residues using continuous gas quantification system.

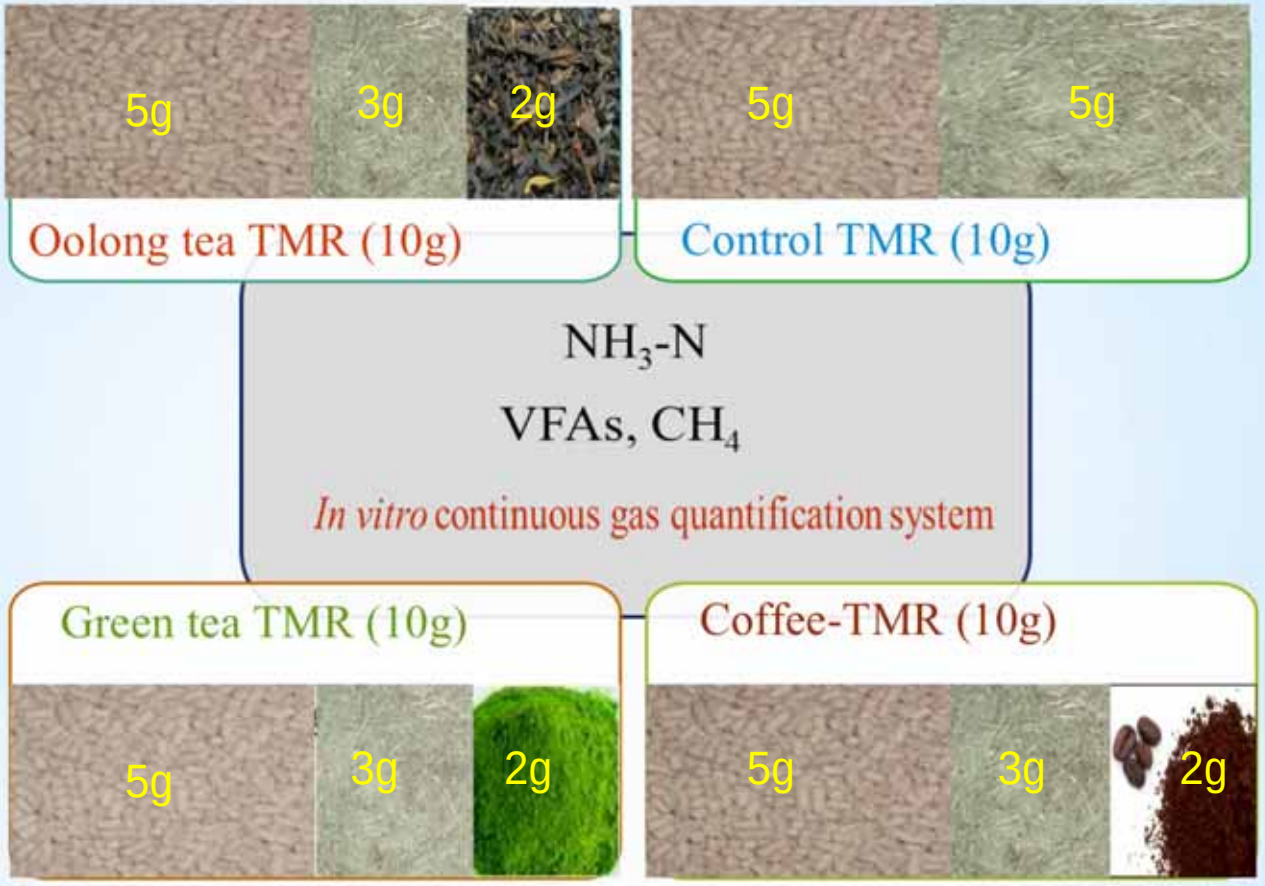
Materials and Methods



Exp. 1: Fermentation of beverage residues

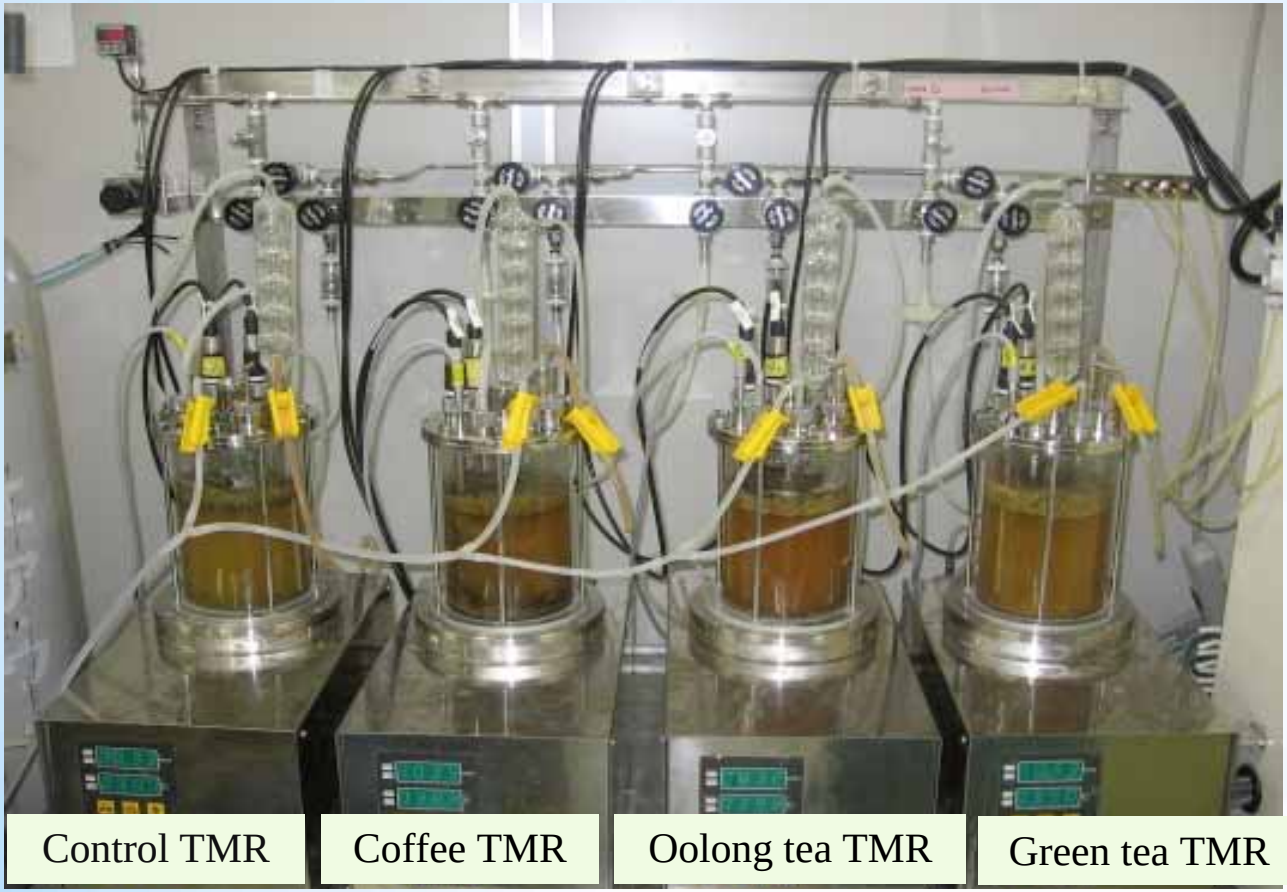


Exp. 2: *In vitro* fermentation of fermented beverage residues



* TMR: Total Mixed Ration

In vitro gas continuous quantification system



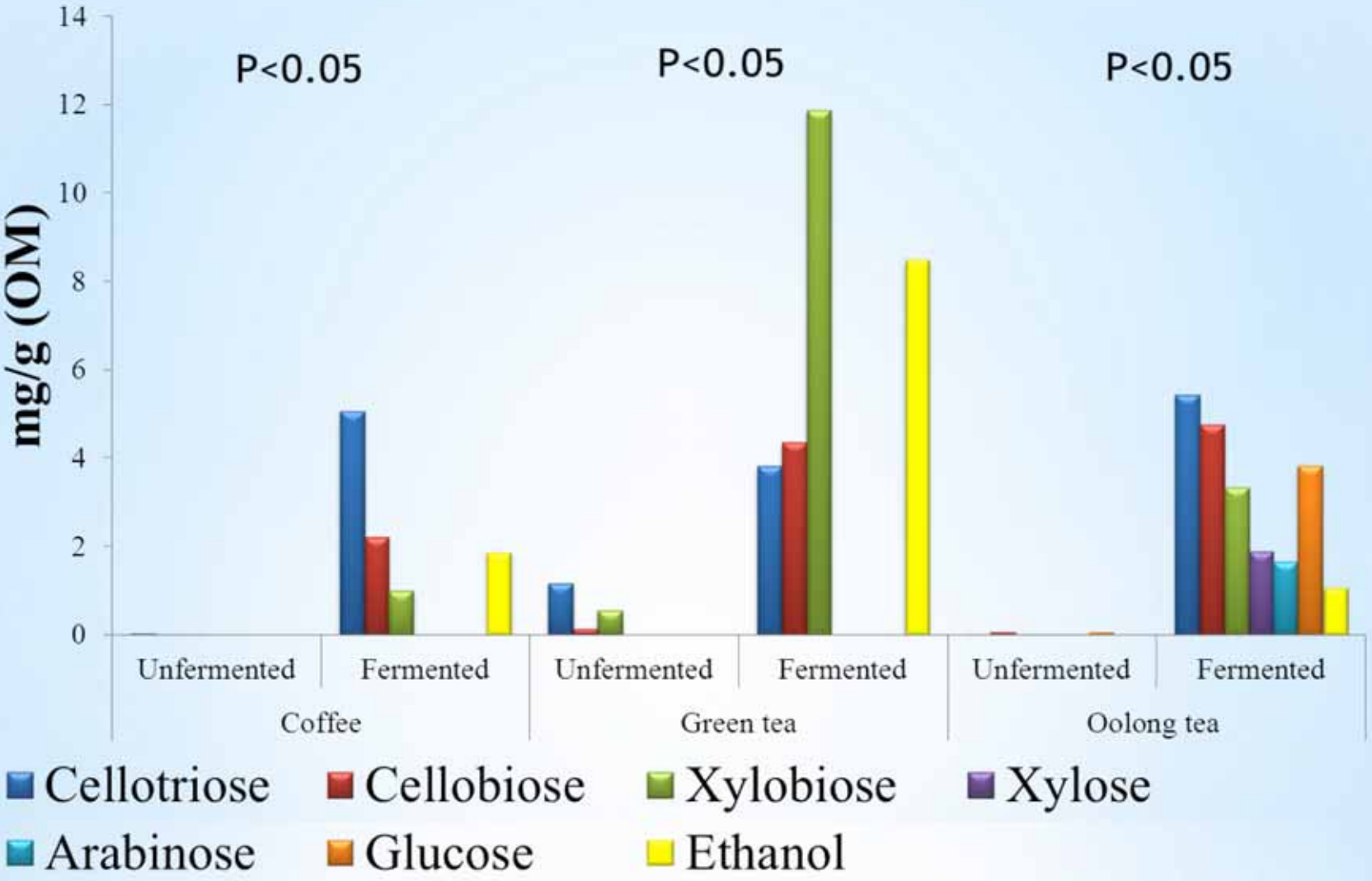
Control TMR | Coffee TMR | Oolong tea TMR | Green tea TMR

Computer

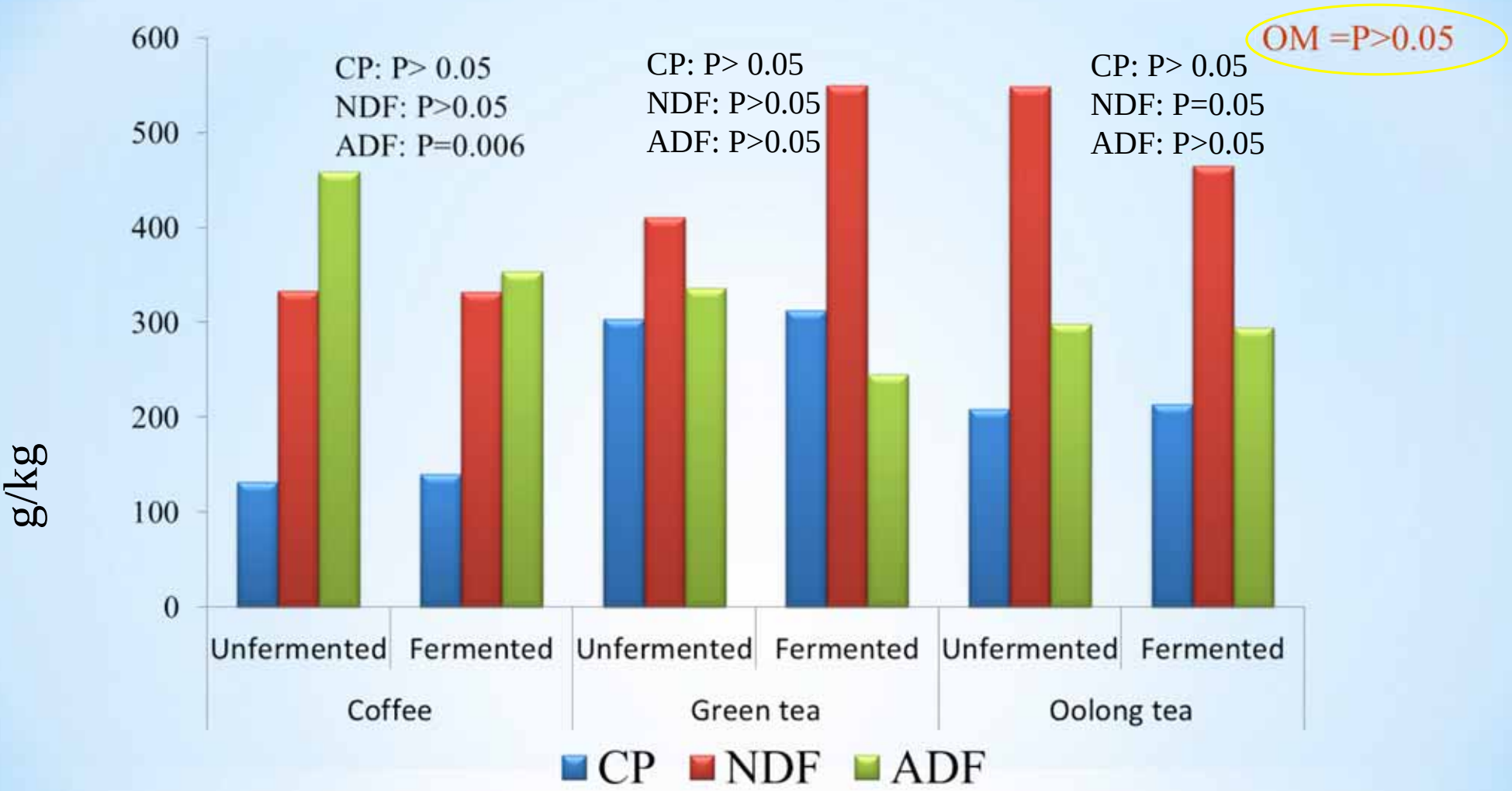
CH_4 gas– Infrared analyzer

10 g sample, 160 ml rumen fluid, 640 ml buffer,

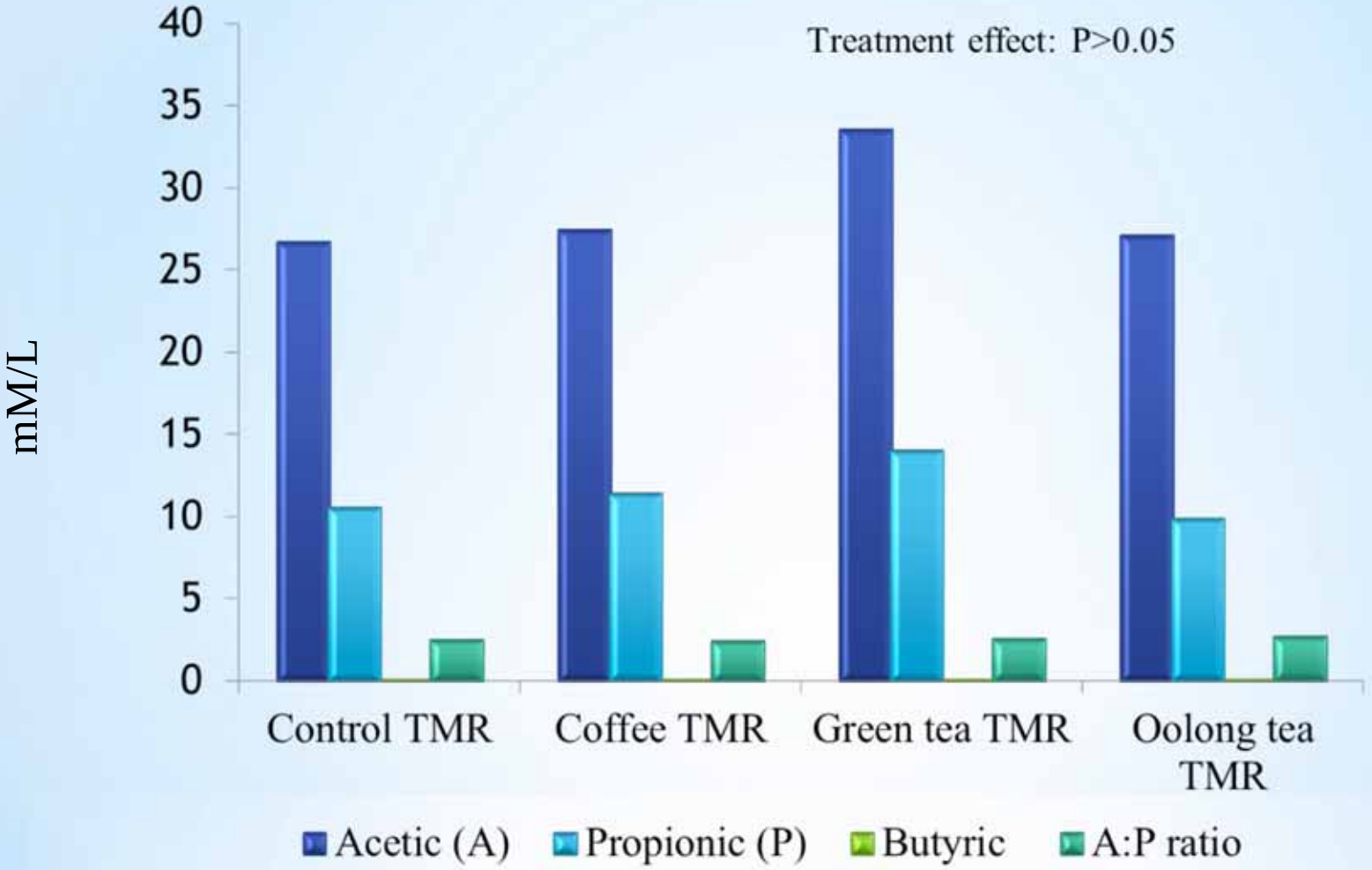
Results



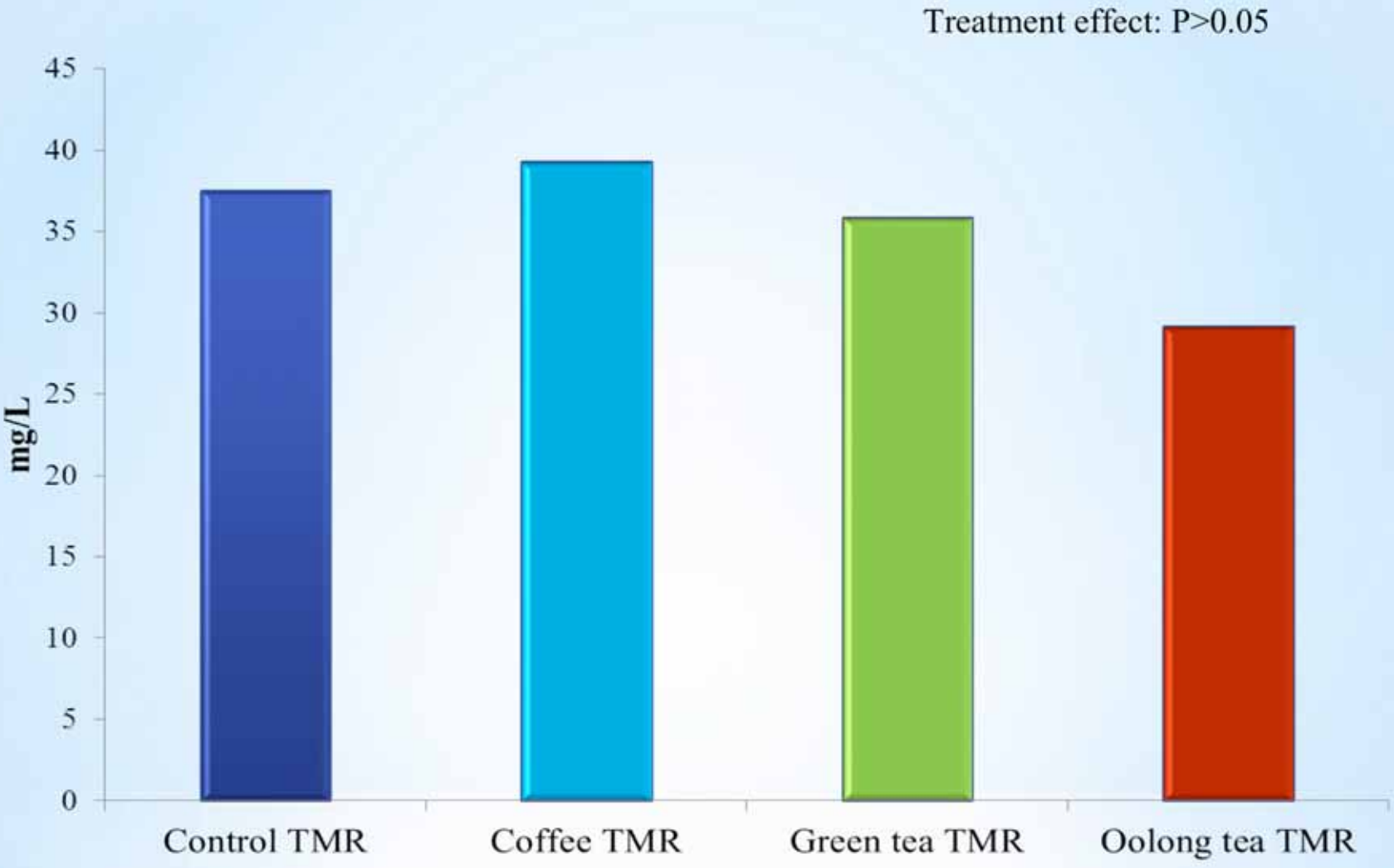
Exp. 1: Saccharide and ethanol concentrations of unfermented and fermented beverage residues.



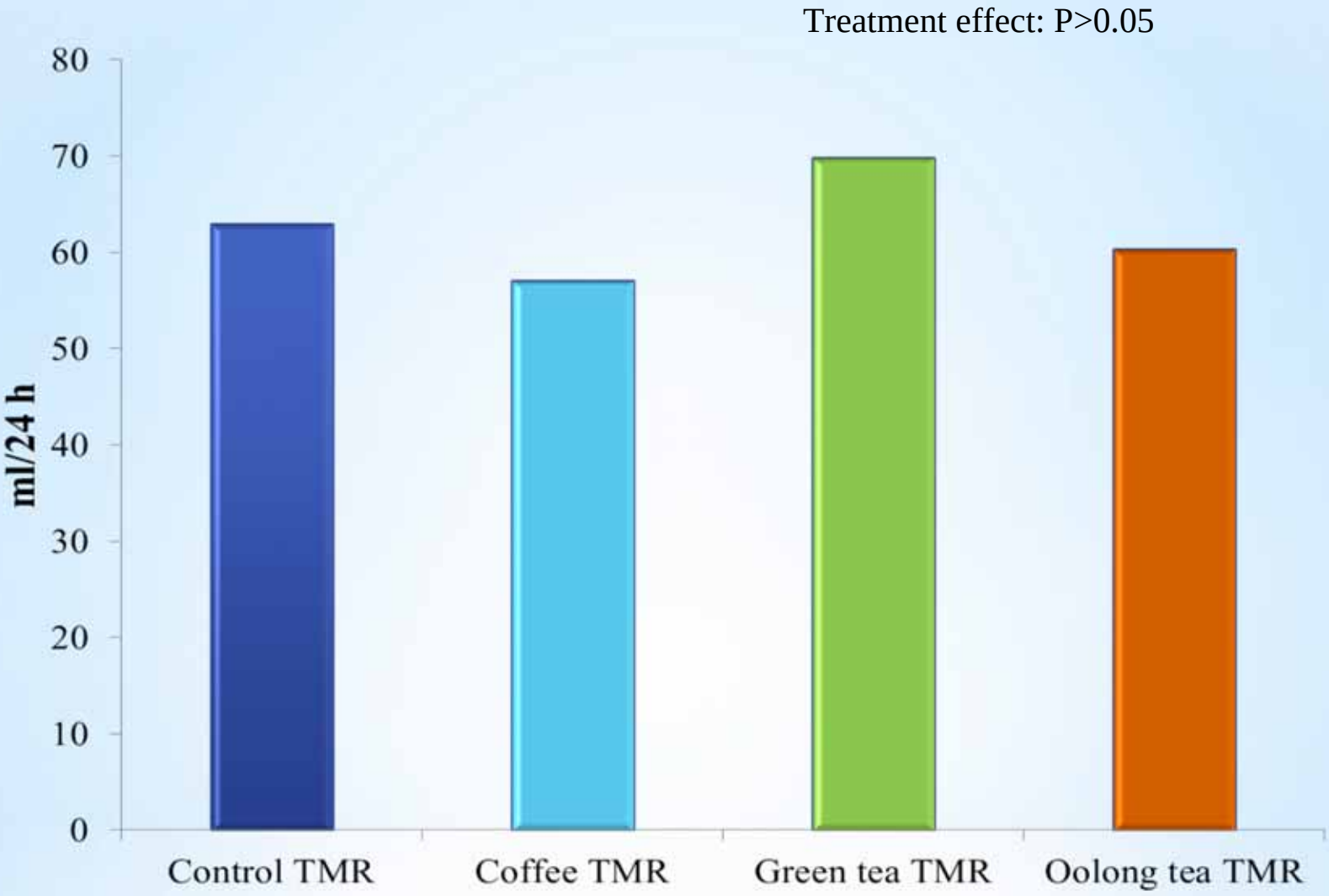
CP, NDF, ADF, OM Exp. 1: composition of unfermented and fermented beverage residues.



Exp. 2: VFA concentration in the incubation medium after 24 h incubation



Exp. 2: Ammonia–N concentration in the incubation medium after 24 h incubation.



Exp. 2: Methane output after 24 h incubation.

Conclusion

Green tea and oolong tea residues are good source of protein and energy as ruminant feed.

Coffee , oolong and green tea residues did not effect significantly to CH_4 production. However, CH_4 was decreased numerically in coffee residues


Thank You