

**Oral presentation: 143**

## **Microbial enumeration assay of fermented products of cassava variety MU51**

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This study was carried out to investigate the effects of solid state fermentation of cassava variety MU51, on the qualitative properties and total viable microbial counts, of the fermented cassava products, developed by changing the fermentation lengths as two days and three days. The steps involved in the product development are peeling, washing, grating cassava roots into a mash, collecting the mash into sacks, dewatering and fermenting the mash under natural environmental conditions. The fermented, wet cakes obtained are further de-watered by oven-drying process to make fermented, dry products. These fermented dry cassava products appear cream-white in color and soft granular or powdered form in texture. Both products have a fermented smell and the pH value is 5. Microbial enumeration assay is carried out for the raw cassava, fermented wet cakes and fermented dry products, using plate count technique. Particular attention is given on mesophilic, aerobic and facultative anaerobic microorganisms. The bacterial count of raw cassava is  $(1.8-2.2) \times 10^3$  colony forming units per gram. For two days fermented wet cake, the bacterial count is  $(2.9-3.4) \times 10^4$  colony forming units per gram and for three days fermented wet cake, it is  $(2.8-3.3) \times 10^4$  colony forming units per gram. During fermentation, the bacterial count increases. Increase of acidity during fermentation and depletion of substrates could contribute to a slight decrease in the viable bacterial population, during later stage of fermentation. The fungal count of raw cassava is  $(6.3-8.6) \times 10^2$  colony forming units per gram. Fungal count of two days fermented wet cake is  $8.5 \times 10^2 - 1.1 \times 10^3$  colony forming units per gram and three days fermented wet cake is  $(1.1-1.3) \times 10^3$  colony forming units per gram. During fermentation, the fungal count increases as fungi are favored by the acidification of pulp and are benefited from the metabolites sourced from the growth of other microorganisms. Bacterial count of two days fermented dry product is  $(2.7-3.2) \times 10^4$  colony forming units per gram and three days fermented dry product is  $(2.6-3.0) \times 10^4$  colony forming units per gram. Fungal count of two days fermented dry product is  $(7.4-8.6) \times 10^2$  colony forming units per gram and three days fermented dry product is  $9.4 \times 10^2 - 1.2 \times 10^3$  colony forming units per gram. This plate count assay can be used as an index to evaluate the microbial content, in order to provide a microbiological specification for the fermented cassava products. Fermented cassava products would be an ideal option that reduces the post-harvest losses of raw cassava.

**Keywords:** Cassava, fermentation, microbial enumeration, plate count