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The Effect of *Pediococcus acidilactici* U318 and *Lactobacillus plantarum* U201 Used as Starter Cultures on the Change of Microbial and Physico-chemical Characteristics of "Urutan"

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[Aim] "Urutan" is a Balinese dry fermented sausage, which is based on the lactic fermentation. Previous investigation showed that in the traditional way, lactic acid bacteria (LAB) were the dominating bacteria growth during fermentation of "urutan". In order to improve the characteristics of "urutan", the using of single and mix cultures of ***Pediococcus acidilactici*** U318 and ***Lactobacillus plantarum*** U201, which were selected from indigenous LAB, were experimented in "urutan" production.

[Method] Artificial of fermentation chambers were simulated to replace the traditional condition of fermentation.. Two fermentation chambers were used under controlled temperature, namely 30 ^{o}C and 45 ^{o}C, and were applied during process of fermentation. The sausages were fermented in two chambers, where the sausages were moved every 12 hours. The fermentation was run for 120 hours. The effects of single culture and mix culture of ***P. acidilactici*** U318 and ***L. plantarum*** U201 on the microbial and physico-chemical characteristics were examined by determining the growth of LAB, ***Enterobacteriaceae*** and micrococci bacteria, the content of organic acids, soluble protein, pH, colour and texture, in "urutan" through out the fermentation. The batter was inoculated to give an initial population level of about 10^{7} cfu/g of single or mix cultures, whereas the control was a batter without starter culture.

[Results] The LAB in all batches of "urutan" increased sharply after 24 hours fermentation. Pattern of LAB distribution in inoculated "urutan" showed an interesting phenomenon. The distribution of LAB in "urutan" inoculated by mix cultures were dominated by rod shape of LAB at the initial up to 48 hours fermentation, and then the tetrad cocci form of LAB started to increase from 48 hours fermentation and suppressed the growth of the rod shape. The growth of LAB associated with the production of acids and reduction of pH, which inhibited the growth of ***Enterobacteriaceae*** and micrococci bacteria. In control batch, the acid production and pH of "urutan" was not able to inhibit the growth of ***Enterobacteriaceae*** and micrococci bacteria. Lowering of pH caused protein denaturation, which subsequently affected the soluble protein content of "urutan". The degradation of protein that monitored by SDS-PAGE was occurred during fermentation. The lightness of "urutan" (L*) showed the same pattern of all batches of "urutan" The low a* value incicated that "urutan" tended to the green colour. The yellowness of inoculated "urutan" tended to decrease during fermentation, which were different with control "urutan" that was stabile relatively during fermentation. Using of mix culture in making "urutan" gave a softer "urutan" than using of single culture.