

Functional Activity of Microbial Communities on Feather Degradation

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The accumulation of feather waste by poultry industry worldwide can reach more than millions of tons per year. The possibility to re-use this protein source encourages the search for treatment to obtain a valuable product, such animal feed. The biotransformation by microorganisms appears as viable alternative. In modern microbiology one of the main findings is the fact that microbial communities could be more efficient than one microorganism acting alone. The study of microbial communities is very complex and requires simple models. In this context, Plackett-Burman (PB) experimental design was use to assess the influence of four microorganisms in the community: three *Bacillus* isolated (S14, NP4 and NP5) and one *Macrococos* isolated (FCA7). Isolated S14 and NP5 presented the best keratinolytic activity each one alone. When put in together their potential was reduced and S14 always show negative influence in the community. However, the negative effect is cancelled when all bacteria were used together, confirming the advantage to live in community. Biofilm formation – a phenomenon involved in biodegradation of insoluble substrates – was monitored by electronic microscopy showing the performance of multi-species on the feather. A new experiment is in progress in order to understand the importance of biofilm in feather degradation. The learning about the influence of each microorganism in a microbial community is very important and could be used as model to explain other similar situations that occurs in nature.

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