

Phoompong Boonsaen 2010: Probiotic Production: Selection of High Potential Fibrolytic Bacteria from Swamp Buffalo Rumen. Master of Science (Animal Production), Major Field: Animal Production, Department of Animal Science. Thesis Advisor: Assistant Professor Suriya Sawanon, Ph.D. 125 pages.

Two consecutive experiments were carried out to isolate the high potential fibrolytic bacteria from swamp buffalo rumen. Four mature, rumen fistulated buffalos were fed either low quality roughage (Rice Straw; RS) or fresh grass (Paragrass; PG). Roughage suspended in buffalo rumen was used as the isolated source. The source was enriched with filter paper degradation, diluted with an anaerobic solution and used for pure culturing by roll tube technique. Degradated filter paper bacteria were collected and gram staining, and then, used for digestibility studies on rice straw fiber powder, VFA profiling and 16S rDNA sequencing were selected and screened for further identification. All of staining bacteria were gram-negative cocci. Thirty strains of best rice straw digestibility were found. Majority of isolated bacteria produced acetate and butyrate some produced valerate. Twenty-six strains were identified, as 7 known bacterial species which were *Butyrivibrio fibrisolvens* (5), *Clostridium* sp. (5), *Fibrobacter succinogenes* (3), *Prevotella* sp. (4), *Streptococcus* sp. (7), *Staphylococcus* sp. (1) and *Selenomonas ruminantium* (1), whilst 4 strains were assigned to unidentified bacterial species.

The second trail was aimed at study (*In vitro* study) on 30 strains fibrolytic bacteria isolated from the first experiment, which selected for high potential fibrolytic enzymes (cellulase and xylanase) and then 5 strains of the high potential fibrolytic bacteria were collected to study, attachment, digestion of various fiber powder (i.e. Rice Straw; RS, Paragrass; PG and Cellulose powder; CP) and total gas production. High potential fibrolytic bacteria consisted of 5 strain consisting of *Prevotella* sp. RS1, *F. succinogenes* RS3, *F. succinogenes* RS4, *Staphylococcus* sp. RS12 and *Clostridium bifermentans* PG85. These high potential fibrolytic bacteria had high activities of cellulase and xylanase. Furthermore, these 5 strains were shown a high percentage of adherents on three different fiber powders.

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Thesis Advisor's signature