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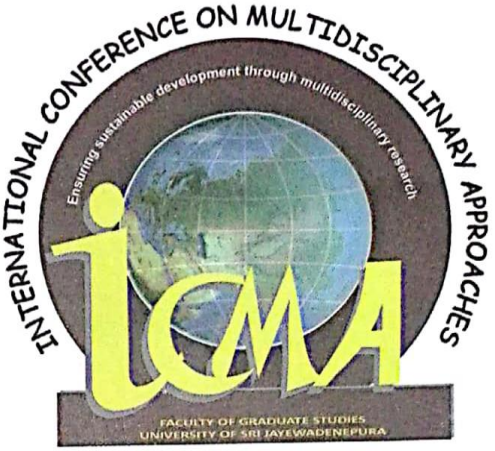

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COMPARISON OF FERMENTATIVE PROPERTIES IN RAW AND BOILED LEGUMES AFTER *In vitro* DIGESTION

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Abstract

Legumes are commonly consumed all over the world due its healthy nutritional profile and beneficial health properties.Legumes are identified as potential prebiotics that stimulate the growth of certain gastrointestinal microbes such as *Bifidobacteria* and *Lactobacilli*, which leads to the formation of (Short chain fatty acids) SCFAs. Processing and digestion are found to alter many functional properties of food. The main objective of this study is to find the fermentative properties of both raw and boiled legumes before and after the *in vitro* digestion.The raw and boiled Mung,Waruni,Dhawala ,Chickpea and Horse gram were subjected to *in vitro* digestion using swine gastric juice and intestinal juice. The digested and undigested legume samples were fermented using swine ceacal microbes. Growth of *Bifidobacterium*, *Lactobacillus* and Coliform were analyzed as average log CFU/ml value and recorded .Short chain fatty acid production was quantitatively analyzed as mmol/L using Gas Chromatography. Both data were recorded and analyzed using three factor factorial model. According to the results it shows that the method of processing and digestion has different impacts on the microbial growth and butyric acid concentration. Among the five tested legumes chickpea was shown to enhance the growth of *Bifidobacterium* ($>1.24\times 10^8$CFU/ml), *Lactobacillus* (2.4×10^8CFU/ml), and reduce the growth of Coliform (9.8×16^8CFU/ml). In addition there was an inverse correlation between the *in vitro* digestion and growth of microbes. However it was found that boiling and digestion have increased the butyric acid concentration in four fermented legumes except horse gram. The highest butyric acid concentration was found in boiled Mung and Dawala after *in vitro* digestion and fermentation (3533.86 mmol/L, 3855.12 mmol/L). Hence, the study reveals that method of processing and simulated digestion modulates the fermentative properties of above five selected legumes.

Keywords: *Legumes, In vitro Digestion, Fermentation, Gastrointestinal Microbes, Butyric acid*