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***In vitro* Assessment for Prebiotic Potentials of Some Carbohydrate/Fibrous Feedstuffs Fed in Broiler Diets**

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Abstract

This experiment was conducted to test possible prebiotic characteristics of ten carbohydrate/ fibrous feedstuffs fed in broiler diets. The following criteria were tested: (a) resistance to gastric acidity, hydrolysis by digestive enzymes, (b) fermentation by intestinal microflora.

In the first part of the experiment, the test feedstuffs were pre-digested in a 3-step pepsin-pancreatin *in vitro* digestion to establish resistance to gastric acidity and hydrolysis by digestive enzymes of the foregut. In the subsequent study, the degree of fermentation by microflora of the hindgut was measured *in vitro* using the cumulative gas production technique. Incubations were carried out using caecal inoculum from specially raised broiler birds fed diets devoid of copper and antibiotics at 4, 6 and 8 weeks of age and gas production was measured as an indicator of the kinetics of fermentation. Incubations were carried out until maximum gas production was achieved for all substrates. Fermentation parameters such as pH, ammonia of fermentation and organic matter loss were measured. Most of the test feedstuffs showed resistance to gastric acidity and hydrolysis by digestive enzymes as over 60 % of the test samples were recovered in residue post-enzymatic digestion. Four carbohydrates; cassava starch, cassava starch residue, cassava root sieviete and sweet potato flour showed potentials for fermentation by caecal inoculum of broiler birds at different ages. Significant ($p < 0.05$) differences were recorded for gas production, pH and organic matter loss for all substrates at different ages, however significant ($p < 0.05$) differences in ammonia production were only observed in the study at 8 weeks. This study has established that cassava starch, cassava root sieviete, cassava starch residue and sweet potato flour are able to resist hydrolysis by enzymes in the gastrointestinal tract of broiler birds but are fermentable in the caecum. Further studies to establish that these feedstuffs can be used to manipulate intestinal microflora populations *in vivo*, to satisfy their use as prebiotics, are in progress.

Keywords: Digestive enzymes, fibrous feedstuffs, foregut, hindgut, intestinal microflora, prebiotic characteristics