

ABSTRACT

An appropriate technological approach was developed for the production of sausages on a small-scale. Two atypical strains of *L. plantarum* were isolated and designated U.W.I./FS 001 and 002. A starter culture medium using pigeon-pea (*Cajanus cajan*) extract and glycerol was developed for the inoculation of sausages with U.W.I./FS 001. Storage of the starter culture medium for 6 months at  $-20^{\circ}\text{C}$ , gave cell counts in excess of  $25 \times 10^6$  cells/ml. There were no significant differences for lactobacilli cell counts between pigeon-pea extract media and MRS of De Man et al (1960). U.W.I./FS 001 reduced the initial cell concentration of sausages inoculated with *E. coli*, *S. aureus* and *S. typhimurium*; eradication of *S. aureus* and *S. typhimurium* was not achieved.

Fermented sausages containing 5, 10 and 11% respectively of pigeon-pea flour, sweet-potato (*Ipomea batatas*) flour and soya (*Glycine max*) meal, with a final fat content (30-43%) in the dried products, were found to be unacceptable to the taste panel, using a modification of the paired-eating methods of Cover (1940) which established the levels of fat to be used in the sausages. Low fat (13-22%) in the dried products containing 5-6% of pigeon-pea flour, sweet-potato flour and soya meal, were acceptable to panelists, using a modification of the multiple-comparisons test. Fermented sausages containing high levels of pigeon-pea flour were found to be significantly firmer than the control treatment.

Fermented sausages were processed at  $38^{\circ}\text{C}$  (wb) /  $37.25^{\circ}\text{C}$  (db) and relative humidity of 95% for 38 hours. Sausages were ripened for periods varying between 30-110 days. In all cases, there were increases in fat, salt, protein and acidity values. Haeme-pigment and pH values decline with time. There were no appreciable differences in chemical compositional changes with time between nitrite-nitrate and non-nitrite-nitrate treated fermented sausages. Desired pH and titratable acidity values were obtained when different formulations were fermented at ambient temperature ( $28^{\circ}\text{C}$ ). There were no significant differences between the regression coefficients of the different treatments.

Increasing the levels of pigeon-pea flour used in non-fermented sausages, adversely affected acceptability. However, high levels of non-meat additive used in conjunction with high levels of seasonings ingredients resulted in greater acceptability of the non-fermented products. The processing conditions used adversely affected the texture of the emulsion-type product. Increasing the level of non-meat additive increased the juiciness of the emulsion-type product.