

[54] **APPARATUS FOR MAKING FOODS AND FEEDS**

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[57] **ABSTRACT**

Apparatus for making foods and animal feeds from starchy raw materials, such as flour, meal and grits of cereals, pulses, starch roots, tubers, oil seeds, cakes of oil seeds, milk products, or mixtures of these materials, which includes: mixing water and at least one high-temperature resistant enzyme with the raw materials to form an extrudable paste; effecting partial gelatinization and initiating fermentation by extruding the paste while heating the paste to a temperature of from 65°C (149°F) to 115°C (239°F); converting the starch into dextrins and sugars by treating the extruded product in a fermentation apparatus for 40 to 90 minutes at a temperature of 55°C (131°F) to 90°C (194°F) in a high humidity atmosphere, as near as possible to saturation; and drying the product after fermentation.

The finished product comprises from about 11 to 24 weight per cent of proteins, from about 4 to about 10 weight per cent of water, from 45 to 70 weight per cent of carbohydrates, from about 7 to 37 weight per cent of sucrose, from 0 to 2.8 weight per cent of ash, from 0 to 5 weight per cent of crude fiber, from 0 to 10.0 weight per cent of crude fat and has a pH value of around 6.5 to about 7.

Apparatus includes an extruder and a continuous drier apparatus, with a fermentation apparatus arranged continuously to receive the shaped products from the extruder and continuously to deliver them to the continuous drier apparatus.

**10 Claims, 4 Drawing Figures**

