

EFFECT OF LIME-TREATMENT ON SOME CHARACTERISTICS OF CORN PROTEINS

Ricardo Bressani^o (Introduced by Robert L. Squibb). Institute of Nutrition of Central America and Panama, Guatemala.

It appears probable that the pellagragenic property of corn is due to the poor amino acid balance of the largest protein fraction, zein. Comparison of the solubility of the proteins of corn with those of tortillas prepared from it by lime and heat treatment showed a reduction in the percentage of nitrogen in the fractions which were water-soluble (16.7% to 9.4%), salt-soluble (14.4% to 7.0%), alcohol-soluble (30.7% to 6.4%) and sodium hydroxide-soluble (28.4% to 15.5%). The marked decrease in the alcohol-soluble fraction which represents a decreased solubility of zein, may be responsible for a better amino acid balance in tortillas than corn. Microbiological assays of the ten essential amino acids plus cystine and tyrosine calculated on the basis of 16 gm. of nitrogen showed significant losses due to the process of preparing tortillas of arginine (13%), leucine (23%) and cystine (18%); a slight increase in several of the amino acids was explained by the cumulative losses of carbohydrate (5%) and non-protein-nitrogen (3%) in the tortilla process. Enzymatic digestion showed total and alpha-amino nitrogen to be released more rapidly from corn than from tortillas during the first 12 hours of hydrolysis. After 48 hours the quantities released were similar. Several of the essential amino acids also appear to be more readily available from corn than from tortilla. Whichever hydrolysis was employed, the niacin and tryptophan contained in corn and tortillas as determined microbiologically was equally well released.