

Essential amino acids in some Indonesian food constituents

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Abstrak

The statement contained in the motto cited above, made as early as the year 1906, still has lost nothing of its value for the present time. Although innumerable investigations have been carried out on proteins, and much insight was gained from this, a lot of problems connected with the proteins, remain to be solved. As is well known, proteins are found in nature in the animal and vegetable kingdoms. The differences between these two groups of proteins are situated in the number and the amount of the various acids present in these proteins.

Up to comparatively recent years, however, the knowledge of the requirement for the amino acids in the diet was limited to information obtained with the young rat. This animal was able to grow when receiving only nine amino acids: namely histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine; and grew significantly better when arginine was also provided. These ten amino acids were called "essential" for the growing rat, the remaining amino acids were called "non essential". However, there was no implication that the dietetically non-essential amino acids are of little or no value. In spite of the cautions issued, there has been a general tendency to assume, that the above classification has a very broad application. The investigations made by Rose et al. (1,2,3,4,5), have revealed that for adult man only eight amino acids are essential, namely, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine. Moreover in these investigations, it was demonstrated, that only foods with sufficient caloric and nitrogen supply and adequate amounts of these eight amino acids simultaneously are able to maintain a nitrogen balance. This fact is of far reaching importance, because, from this it follows, that the nutritive value of a meal, with respect to the proteins, is determined by the total amount of essential amino acids - in the proper proportions - present in the constituents of the meal. In Indonesia, rice is the most important constituent of a meal. However rice contains such a small amount of some essential amino acids, that even larger use is not sufficient to meet the requirements of man. Therefore, other foods, which complete this shortage, must be used in combination with rice.

In general, in Indonesia, foods containing animal protein are relatively scarce; therefore, it is necessary to replace these with foods containing vegetable protein. An important source of plant protein is found in the soybean. As a general rule, the soybean yields fair crops, without asking too much care. Botanically, the soybean has been referred to as *Glycine hispida* (Moench) Max. Recent studies indicate that the correct botanical name should be *Glycine max* (L.) Merrill according to international botanical rules (6).

The early history of the soybean, like that of most important food crops, is lost in obscurity. In the Far East story tellers for centuries have related, tales of the remarkable history of the soybean. Ancient Chinese literature reveals that the soybean was extensively cultivated and highly valued as a food. There it is said to be one of the grains planted by one of the gods of agriculture, named Hou Tsi. The first written record of the plant is contained in the books *Pen Tsao Kong Mu*, a materia medica written by Emperor Sheng Nung in 2838. B.C.

In many of the early writings advice of agricultural experts is given on soil preferences, proper time of

planting, methods and rates of planting, the best varieties to plant under different conditions and for different uses, time to harvest, methods of storage, and utilization of the many varieties for different purposes. Some of this expert advice goes as far back as 2207 B.C. The soybean was included in the second class of drugs, and was regarded as having many medicinal virtues; it was regarded as a specific remedy for the propel functioning of the heart, and other organs.