

CHEMICAL COMPOSITION OF HUSKED AND POLISHED RICE

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The food value of rice depends on the conditions of its growth and harvesting and on the methods for its industrial processing [1].

We have investigated the chemical compositions of husked and polished rice of breeding varieties grown in the Central Asian region (Table 1). The rice samples were obtained from the Iskrynski Strain-Testing Station, Republic of Uzbekistan. The processing of the initial rice into a standard polished grain was carried out in a LUR-1 laboratory apparatus.

The amounts of protein, carbohydrates, lipids, and ash were determined by the method of [2].

The amino acid composition of the proteins (Table 2) was determined after acid hydrolysis on a Hitachi-835 amino acid analyzer (Japan). Tryptophan was determined by Lin's method [3].

The husked rice was characterized by a high lysine content and a smaller glutamic acid content, which is explained by the presence in the husked rice of an aleurone layer and an embryo, with their characteristic amino acid compositions.

The amino acid content of the husked rice was somewhat higher than that of the polished rice. Of great importance is the amount of essential amino acids in the protein and their ratio, and to determine these we used the chemical method of calculating the amino acid score [4].

The amino acid scores of the husked and polished rice are given in Table 3.

TABLE 1. Chemical Composition of Rice (% on the dry weight)

Index	Husked rice	Polished rice
Protein (N × 25)	8.76	7.92
Lipids	1.80	0.60
Carbohydrates	84.80	87.60
Ash	1.3	0.60

TABLE 2. Amino Acid Composition of Rice (% on the protein)

Amino acid	Husked rice	Polished rice
Lysine	4.23	3.85
Histidine	2.42	2.39
Arginine	7.38	7.29
Aspartic acid	9.56	9.49
Threonine	3.70	3.71
Serine	4.98	4.94
Glutamic acid	16.76	18.08
Proline	5.28	5.24
Isoleucine	3.48	3.43
Alanine	5.55	5.48
Valine	6.20	5.99
Methionine	2.47	2.30
Isoleucine	4.35	4.24
Leucine	8.01	7.91
Tyrosine	3.45	3.44
Phenylalanine	5.20	5.20
Tryptophan	1.98	1.71
Cystine	1.40	1.48

TABLE 3. Amino Acid Scores of Rice

Amino acid	Husked rice	Polished rice
Isoleucine	109	106
Leucine	114	113
Lysine	77	70
Methionine + cystine	111	108
Phenylalanine + tyrosine	144	144
Threonine	93	93
Tryptophan	198	198
Valine	124	120

The difference in the biological values of the husked and the polished rice was slight, the amounts of lysine and threonine in the samples investigated being limited. However, on the whole, the husked rice contained a larger amount of proteins and lipids, which characterizes its higher nutritional value than that of polished rice.

REFERENCES

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