AMINO ACID CONTENT IN THE PROTEIN OF SEEDS OF DIFFERENT TAXONS OF PEAS

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Because different workers have obtained different estimates (1,2,4,5) of amino acid content in pea protein, we undertook in 1976-77 to investigate the content of lysine, methionine, and cystine in 50 populations, lines, and cultivars of peas belonging to different taxons.

Amino acid content in hydrolysates of pea-flour was estimated in two repetitions by the Beckman automatic analyzer, "Multichrom B". Acid hydrolysis of protein (6) was preceded by the oxidation of the flour (3). The results of methionine and cystine were lower than the data given in the references.

This paper presents only the highlights of a large body of data that were collected. The average results were compiled separately for wild and cultivated peas (Tables 1 and 2). In the group of cultivated peas the classification as to convarieties is related to use roughly as follows: medullare (garden peas), sativum (field peas for seeds), speciosum (field peas for green forage).

Table 1. An average content of lysine, methionine, and cystine in % of seed protein. Wild peas. 1976-1977.

Species	Subspecies	No. of populations	Total protein content in %	Amino acids content as % of protein		
				Lysine	Methionine	Cystine
P. abyssinicum	-	1	26.3	6.66	0.99	1.11
" "	-	7	25.9	6.85	1.03	1.07
" elatius	-	2	25.5	6.75	0.79	0.95
" "	-	1	26.9	6.99	1.00	1.03
" syriacum	-	1	26.8	7.22	0.90	1.02
" "	-	Karsyiaca-2	27.3	7.51	1.10	1.23
" sativum	transcaucasicum	2	25.7	6.64	0.86	1.01
" "	"	1	26.6	6.77	0.99	1.10
" "	asiaticum	2	27.2	6.90	0.85	0.92

Table 2. An average content of lysine, methionine and cystine in % of seed protein. Cultivated peas. 1976-1977.

Convarieties	Varietas	Line	Total protein content in %	Amino acids content as % of protein		
				Lysine	Methionine	Cystine
medullare	Schneebergeri	India 123	27.7	7.20	1.04	0.86
"	Pervicax	Wunder of Kelwedon	28.4	7.54	1.15	1.20
"	Balticum	Centurion	27.1	7.83	1.18	1.21
sativum	Episcopii	Auralia	23.4	7.31	0.98	1.15
"	Gratiosum	Flavanda	23.1	7.77	1.07	1.08
"	Superfluens	Stral	26.8	8.02	1.17	1.29
speciosum	Thebaicum	Hero	27.0	7.31	1.13	1.34
"	Concolor	Romac	26.5	7.47	1.15	1.24
"	Zeylanicum	Arwika	29.8	8.05	1.11	1.12

Among the wild peas, populations of P. syriacum (Table 1) had the highest lysine content. Little variation was noted, however, with respect to the content of the sulfur containing amino acids, methionine and cystine. In cultivated peas (Table 2), some variation in lysine content was evident. However, the majority of fodder, colored flower, varieties had a slightly higher total content of sulfur containing amino acids than the field and garden, white-flowered peas. The exception was the variety Stral, obtained by mutagenesis. Overall, the tables show that, except for P. syriacum, the rest of the wild species and subspecies had a lower lysine content in the protein of seeds than cultivated peas. Moreover, except for the Turkish population, Karsyiaka, they also had less methionine and cystine. Thus the most productive varieties, belonging to the groups episcopii, gratiosum, and superfluens, had the highest amino acid content (7).

We plan also to analyze the collection of natural and induced mutations gathered in Plant Experiment Station Wiatrowo.

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