Physical performance by weightlifters after consumption of nutritive preparations

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In order to increase performance and maintain health, it is common for sportsmen to consume various nutritive preparations containing, for example, vitamins, amino acids, proteins and minerals, particularly iron. It is often considered that the intense physical activity of sportsmen requires an increased intake of such substances, compared with the requirements of those who lead physically less active lives. Systematic evaluation of the effects of these substances has been rather rare. On the contrary, any effects have often been judged subjectively.

The purpose of this experiment is to endeavor to assess how consumption of various nutritional preparations during training affects weightlifters.

Test subjects and procedure

42 weight lifters (aged between 18 and 24) of good but not international standard were divided at random into 6 groups each consisting of 7 persons. One control group was not given nutritive supplements, while each of the other groups received various preparations, as shown in Table 1.

Table 1
Nutritive preparations used:

1. Multivitamin preparations (Polfa®) (A_1, B_1, B_2, nicotinamide, pyridoxine, Ca pantothenate, B_{12}, C, D, E) in approximately double the recommended daily doses.
2. Hemoglobin preparation (Hemoglobin-caps®), 2 g/d
3. Multivitamin preparation (Vitaral®) A_1, B_1, B_2, pyrodoxin, C, D, approximately normal recommended daily dose.
4. Pollen preparation (Pollitabs sport®), Cernelle – 4 tablets daily, pollen extract, Cernitin T60 – 50 mg, Cernitin GBX – 1 mg per tablet.
5. Pollen/ amino acid preparation ("Stark-protein®" – 8 capsules daily, Pollitabs® - 4 tablets daily, Cernelle). Pollen extract, Cernitin T60-50 mg. Cernitin GBX – 1 mg./1 tablet. Amino acid concentrates containing 18 free amino acids, including all the essential ones: 350 amino acids per capsule.
6. No nutritive preparations.

The work capacity of the participants, measured with a standard bicycle ergometer at the beginning of the experiment and then again after 6 weeks at the training camp, at which all the participants undertook approximately the same type of training. The increase in the blood's lactic acid level after 10 minutes of cycling, with a load of 2 watts per kg of body weight was measured before and after 6 weeks of training. The results were processed according to normal statistical procedures and the Student "t-test."

Results

Work capacity, expressed in terms of oxygen consumption per kg of body weight, increased in all participants during the training period. There were, however, considerable differences among the groups; differences which, for three of the nutritive

preparations, were significant in comparison with the control group (see Table 2).

The increase in lactic acid concentration in the blood after 10 minutes of cycling showed a decline after 6 weeks of training in all groups. However, the decline differed from group to group and diverged significantly from the control group in two of the groups given nutritional supplements (Table 3).

Table 2 Average increase of work capacity after 6 weeks of training.

	Increase %	Significant level compared to control group
1. Multivitamins	93	5%
2. Hemoglobin preparation	84	5%
3. Multivitamins	48	no change
4. Pollen extract	70	no change
5. Pollen extract + amino acids	123	1%
6. Control group	31	--

Table 3 Average decrease in lactate after exercise and after 6 weeks of training.

	mM/1	Significant level compared to control group
1. Multivitamins	2.3	5%
2. Hemoglobin preparation	1.9	5%
3. Multivitamins	1.5	no change
4. Pollen extract	1.7	no change
5. Pollen extract + amino acids	2.6	1%
6. Control group	1.4	--

Summary:

The work capacity of weightlifters, and the formation of lactate in their blood, during a 6-week training period were significantly affected by the administration of various nutritional substances. A multivitamin preparation and a combination of amino acids and pollen show the greatest effect.

Disscussion:

The fact that the increase in lactic acid after exercise decreases and work capacity increases in connection with training is, of course, well-known and self-evident. The differences between the changes noted among the groups must reasonably be attributed to the administration of different nutritional substances. The greatest changes in both variables were noted in the group given the combination of Polltiabs and "Stark-protein" ("Strong" or "concentrated" protein), while Pollitabs alone did not produce any significant difference compared to the control group. The protein administered in the form of "Stark-protein" corresponded to only about 2.8 g of protein per day and could not reasonably have affected in any way the protein balance. The overall effect must therefore be caused by some form of synergism between the amino acids in the "Stark-protein" and the pollen extract.

Of course, on the basis of this relatively small experiment, it is not possible to analyse with certainty the relative importance of the various factors. Nevertheless, the experiment does support the notion that various nutritional additives – particulary the combination of pollen extract and amino acids – can lead to a distinct improvement in performance in connection with training.

In discussions about the importance of vitamins to physical performance, it has sometimes been said that the benefits of vitamins observed among Eastern Bloc performers – as distinct from the results of experiments in the West – could be attributable to a lower vitamin "status" in the Eastern Bloc. All of the weightlifters participating in the experiment enjoyed a balanced, high-vitamin diet. Thus, latter interpretation is not confirmed by the present experiment.