Abstract

Skeletal muscles are remodeled in response to chronic exercise training. Training induces adaptations, which can be reflected by changes in contractile protein functions, mitochondrial amount and functions and also in specific enzyme activity. Due to extensive training muscle proteins and enzymes permeate through sarcoplasm and can be detected at blood plasma.

Six male rowers, 19,6 ± 2,1 years old (trained), six sedentary men, 20,2 ± 1,8 years old (untrained) were included within this report. Except mentioned groups, two individual clinical cases: one male user of androsten, 28 years old, and one male user of erythropoetin (EPO), 32 years old, were also included at this theses. To report any species influence, the groups (five females per group) of two domestic animal species (cow, pig) with different treatment (housed, outdoor) were also included.

Blood concentration of erythrocytes, blood plasma concentration of proteins, activity of lactatedehydrogenase (LDH), malatedehydrogenase (MDH) and enoyl-CoA-hydratase were measured as well as quantitative pattern of LDH isoenzymes.

The only one difference for man was observed: a significantly higher concentration of plasma protein for untrained group. On the other hand, the outdoors cows had a significantly higher concentration of erythrocytes and activity of LDH than housed one. No other differences were measured for animals or men.

Also the influence of training protocol was tested with detected changes of enzymatic activities and of LDH isoenzyme pattern.

**Keywords:** lactate dehydroganase, malate dehydrogenase, enoyl-CoA-hydratase, enzyme activity, adaptation of metabolism to exercise stress

(in czech)