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Soluble milk proteins promote the recovery of muscle functional properties after an immobilization

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INTRODUCTION

It has been shown that soluble milk proteins are more efficient in the recovery of muscle mass after a period of immobilization. However, their effect on muscle functional properties remains unknown.

OBJECTIVE

To evaluate the effect of milk proteins quality on the recovery of muscle functional properties after an immobilization.

METHODS

After an initial (I0) evaluation of the contractile properties of the plantar flexors (isometric torque and concentric power), the ankle of 30 adult rats was immobilized by casting for 8 days. After cast removal, rats were fed either with a diet with 13% of casein (CAS); or 13% of native soluble milk proteins (NAT); or 13% of proteins from whey (WHEY). During the recovery period, contractile properties were evaluated 7 (R7), 21 (R21) and 42 days (R42) after cast removal.

RESULTS

The immobilization induced an homogeneous depression of isometric torque and concentric power in all the experimental groups. At R21, isometric torque had fully recovered in WHEY and NAT, but was still significantly depressed in CAS, where complete recovery occurred at R42. No significant difference of power recovery kinetics was observed between CAS, WHEY and NAT at R21. However, power was increased in NAT at R42 as compared to I0 (+ 14.7 ± 26.0% ; $P<0.001$), but not in CAS and WHEY.

DISCUSSION/CONCLUSION

Soluble milk proteins clearly speed up the recovery of isometric torque as compared to casein. However, in dynamic condition, the increase of concentric power above baseline values is only observed in the group fed with native soluble milk proteins.