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## From our preclinical study, enrichment of Food with “Energy Saver” Probiotics: A promising strategy to reduce sarcopenia in Undernourished Elderly

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### **Abstract**

In 2050, older adults (65+) will reach 35% of European population with sarcopenic individuals representing a third of them. Specific nutritional strategies based on proteins coupled or not with exercise have shown some beneficial effects to limit sarcopenia but depending of the physio-pathological state, they may not be optimal or not applicable in case of poor appetite or difficulties/disabilities to perform exercise. Consequently, additional strategies require to be developed to limit sarcopenia in such specific populations, and this, independently of food intake.

In a recent study, we observed that in small intestine-resected patients whose gut physiology and metabolism have adapted to improve efficiency of nutrient utilization, a specific microbiota has developed with a large increased in *Lactobacilli*. We hypothesized that selected bacterial strains issued from these patients could be of interest to improve energy efficient in malnourished frail elderly. We isolated strains from their faeces and one strain belonging to *Lactocaseibacillus casei* (LC- 5663) was tested *in vivo* in aged rats (18 months) under moderate caloric restriction (75% of ad libitum). Body composition, muscle mass and insulin sensitivity was assessed (OGTT, HOMA IR).

We showed that caloric restriction induced a decrease of muscle but that a daily intake of LC-5663 for one month (~10<sup>9</sup>) was able to significantly prevent 12% of the sarcopenia observed (ANOVA, p<0.05). The protective effect could be explained by an improvement of insulin sensitivity as reflected by a 25% decrease of HOMA-IR index (ANOVA, p=0.056).

The existence of a microbiota-gut-muscle crosstalk is an interesting approach to limit sarcopenia in the elderly. However, the mechanisms involved in improving insulin resistance and its impact on muscle remain to be determined.