NUTRITION

**REDUCE CALORIES,
LIVE LONGER?**

Restriction of calorie intake (10–40% reduction) has health benefits and improves survival in many species. However, new findings show that non-human primates receiving a reduced-calorie diet do not live longer than control animals given a healthy diet.

In a ≥ 20 -year study conducted at the National Institute of Aging (NIA), Dickerson, USA, calorie restriction did not increase longevity or influence cause of death in macaques that were aged 16–23 years when the diet was imposed. However, these animals weighed less and had lower serum levels of triglycerides than did controls. Additionally, male macaques in the calorie-restricted group had lower levels of fasting glucose, cholesterol and plasma free isoprostane, a marker of oxidative stress.

In animals aged < 14 years when calorie restriction was imposed, the benefits of the diet were not as clear as in the older cohort. Specifically, fasting glucose and triglyceride levels were not significantly reduced. However, the calorie-restricted group did have a reduced incidence of diabetes mellitus and cancer, and improved immune function.

Intriguingly, the findings of this study are in contrast with those of another ongoing study at the University of Wisconsin. The other group has shown that calorie restriction improves both survival and the incidence of age-related diseases in non-human primates. Notably, however, the composition of the diets fed to the animals in the two studies was markedly different and the animals had differing levels of genetic diversity. The animals in the NIA study were fed a diet based on natural ingredients and varied nutritional sources. By contrast, the animals in the Wisconsin study were fed an artificial diet rich in sucrose. Conspicuously, the control animals in the Wisconsin study were $> 15\%$ heavier than corresponding animals in the NIA study.

“We want to understand the factors contributing to these different results,” explains Julie Mattison, lead investigator of the study at the NIA. “We will be doing a combined analysis in collaboration with the group from Wisconsin. The effect of calorie restriction is complex and is probably affected by many other parameters such as the quality of the diet, age at diet modification and genetic background.”

Fiona Mitchell

Original article Mattison, J. A. *et al.* Impact of caloric restriction on health and survival in rhesus monkeys from the NIA study. *Nature* doi:10.1038/nature11432