EXTRA PROTEIN CAN HELP ENDURANCE ATHLETES

Endurance athletes who follow an intensive training progamme while consuming extra protein make faster progress than their counterparts who don't eat extra protein, shows a PhD study by Pim Knuiman at Human Nutrition and Health.

Knuiman's findings come from a study involving 44 healthy young men, all of whom exercise for fun. They trained three times a week for 10 weeks on a bicycle ergometer at an intensity just below the point where muscles start acidifying. Half the group were given extra protein in the test period: they had a drink with 28 grams of casein in it after each training session and before going to bed. The other half had a protein-free carbohydrate drink that looked and tasted the same. Neither the athletes nor the researchers knew who was in which group.

Training increases athletes' maximal oxygen absorption uptake – the VO_2max. 'But we saw a bigger increase in the protein group,' says Knuiman. 'And the extra protein consumption had an effect on their body composition as well: the amount of non-fat mass increased in the protein group, while their fat mass decreased.' This improved body composition is good for health and sporting performance.

His research does not give Knuiman a basis for concluding that performance capacity increased due to the protein drinks too. 'Our study took the VO_2max as the outcome measure.' Besides oxygen uptake, Knuiman studied changes in muscle. 'Training improves the oxidative capacity of muscle: its capacity to generate the molecule adenosine triphosphate using oxygen goes up. We measured that oxidative capacity using the maximum enzyme activity.'

Knuiman found no significantly larger increase in enzyme activity in the men who had the protein drink. But he did see a trend towards higher activity levels. And that suggests that their muscles had adapted more in response to the training, and are thus better able to go through this kind of intensive training.

So does Knuiman now advise all endurance athletes to consume more protein? 'Not at this point. In our training programme it looks like an effective strategy. But further research needs to determine whether it is also effective at a different training frequency or intensity, or with a different status of the individual in question.' **AJ**

PHOTO: PIM KNUIMAN

▲ For the study, 44 healthy young men trained three times a week for 10 weeks on a bicycle ergometer.

VISION

'Extra nitrogen measurements won't replace RIVM model'

Agriculture minister Carola Schouten is providing cash for more nitrogen measurements in nature. That's good, says Karin Groenestein, livestock and environment researcher at Wageningen Livestock Research, but you still need RIVM's contentious nitrogen distribution model.

Are there not enough nitrogen measurements in the Netherlands?

'RIVM has two measurement networks. One network measures the concentration of ammonia in the air at 280 sites in 84 nature areas. The other network has six stations that measure the ammonia pollution layer in the Netherlands. Those measurements do not give precise data on where the ammonia comes from or ends up. The minister wants to extend the measurements to get a better understanding of the spread of ammonia.'

Should you measure ammonia emissions on farms as well?

'Wageningen Livestock Research already measures methane and ammonia emissions in about 30 barns for dairy cows, pigs, goats and calves. We compare the emissions in different barn systems because we want to know which farms produce the least ammonia and methane.'

Farmers are highly critical of the RIVM model. Could these measurements replace the model?

'There has been a lot of fuss about RIVM's nitrogen distribution model but there is little basis for the criticism. The new measurements won't replace the model; they will make it more reliable. If you carry out measurements, you need to put them in perspective. Concentrations will be higher some days than others, depending on factors such as the weather and the wind direction. If you want to know how much ammonia ends up where, you need a model that takes account of those factors.'

Will extra measurements help farmers?

'We are now getting the opportunity to investigate how we can optimize a farm's nutrient cycle with minimal emissions of ammonia and methane. We can't measure all farms as that would be too expensive, but cheaper sensors are now being developed that can accurately record the emissions per farm. Then the government could introduce stipulated targets, and the sensors would show whether the farmer is keeping to the rules. Those sensors are nearly there.' **AS**