

DOES LITOVET<sup>®</sup>, A HERBAL REMEDY MADE FROM ROSA CANINA,  
ACT AS AN ANTI-INFLAMMATORY AGENT IN HORSES EXPOSED TO  
STRENUOUS EXERCISE?

A RANDOMIZED, PLACEBO-CONTROLLED, PARALLEL, DOUBLE-  
BLINDED STUDY ON THE IMMUNE SYSTEM OF HORSES, THEIR  
WORKING CAPACITY AND BEHAVIOUR

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## INTRODUCTION AND AIM

A standardised product, LITIZIN<sup>®</sup>, made from rose hip (*Rosa Canina*), has shown anti-inflammatory and pain reducing properties in humans.

The present study aimed to test if LITOVET<sup>®</sup>, a version of LITIZIN<sup>®</sup> especially developed for horses, would affect the immune system, working capacity and behaviour of horses

## METHODS I

Seventyfour horses, all trotters, were included in a double-blind, placebo controlled trial.

The horses were randomized in blocks of three of which two received LITOVET<sup>®</sup> and one placebo of similar taste and colour.

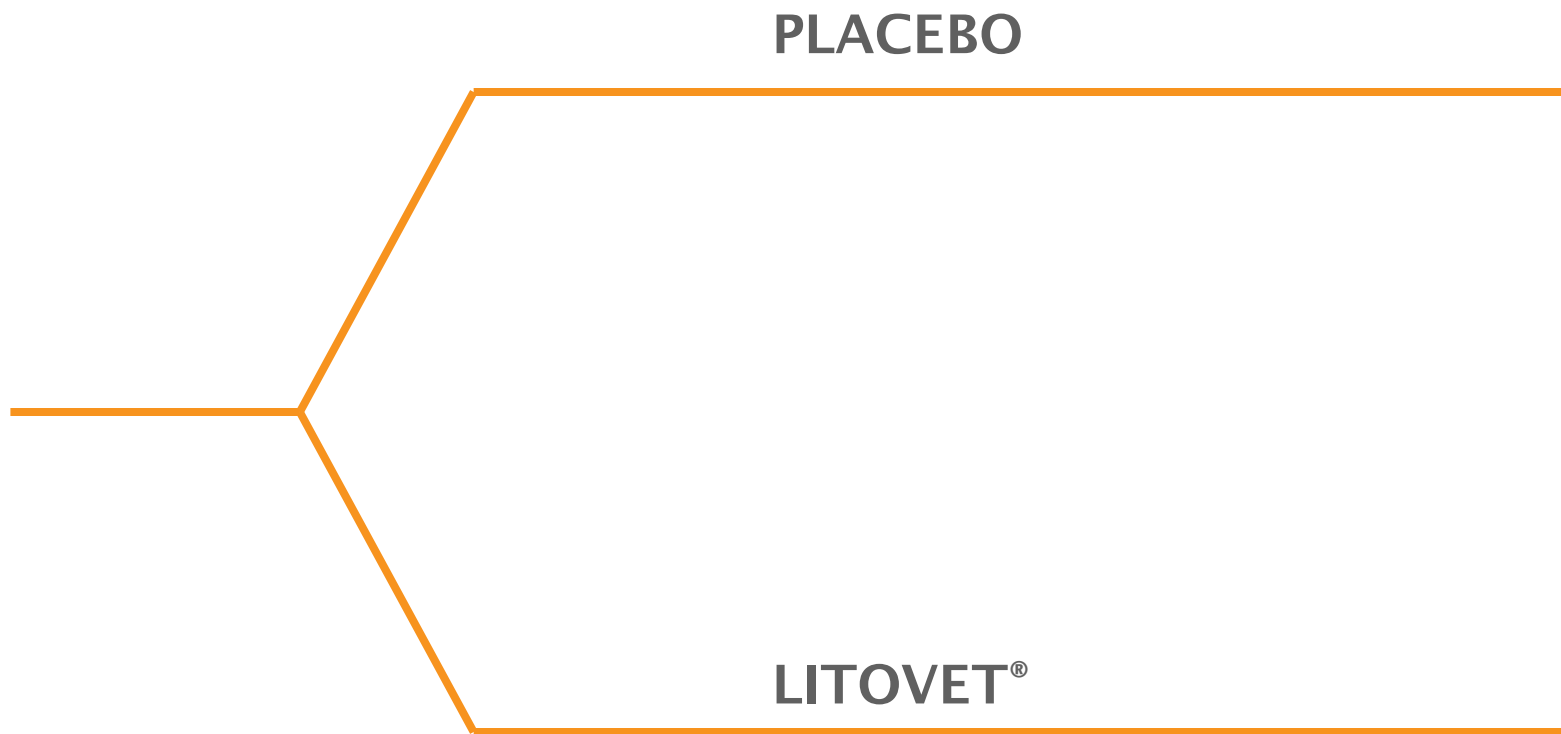
Then the LITOVET<sup>®</sup> group, as well as the placebo group, were treated for three months.

## METHODS II

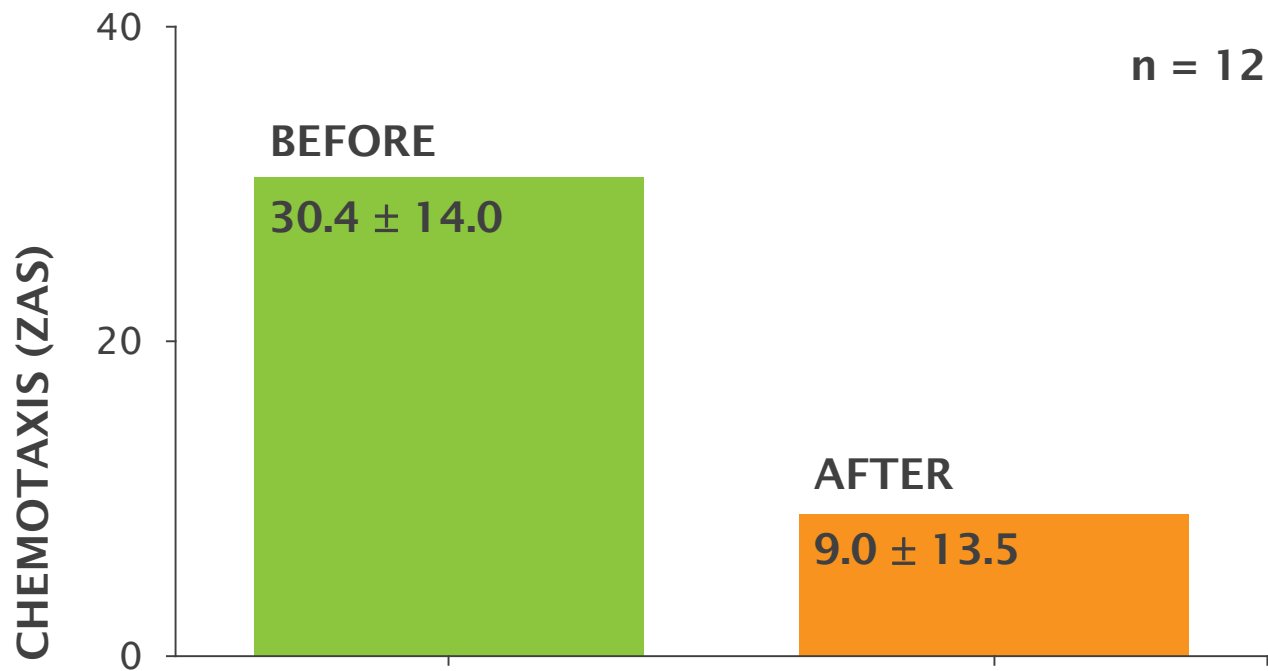
The chemotaxis of neutrophils was estimated using a Boyden chamber, haematology using normal laboratory routine, and the time to run 1000 metres by simply counting the minutes.

Behaviour was evaluated on a questionnaire which was answered by the staff taking daily care of the horses.

# FLOW CHART

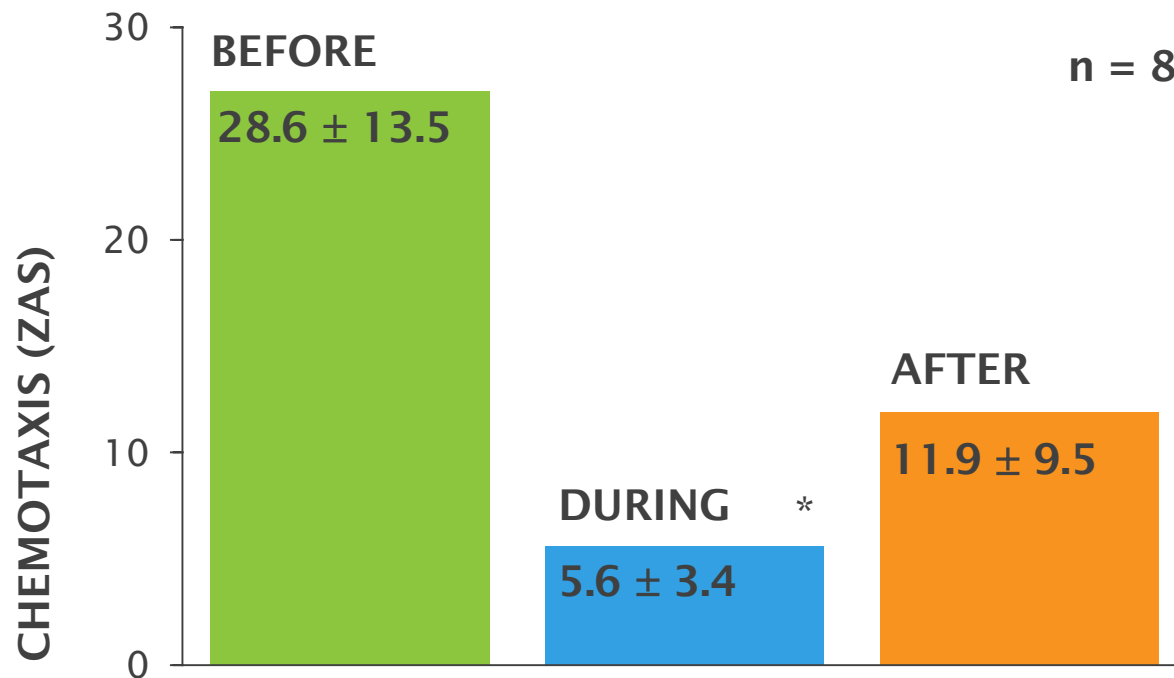


# NEUTROPHILE LEUCOCYTE CHEMOTAXIS IN HORSES BEFORE AND AFTER TREATMENT WITH LITOVET® (0.5 g/kg).



Three months treatment with LITOVET® resulted in a significant reduction in chemotaxis (\*  $p < 0.0039$ ).

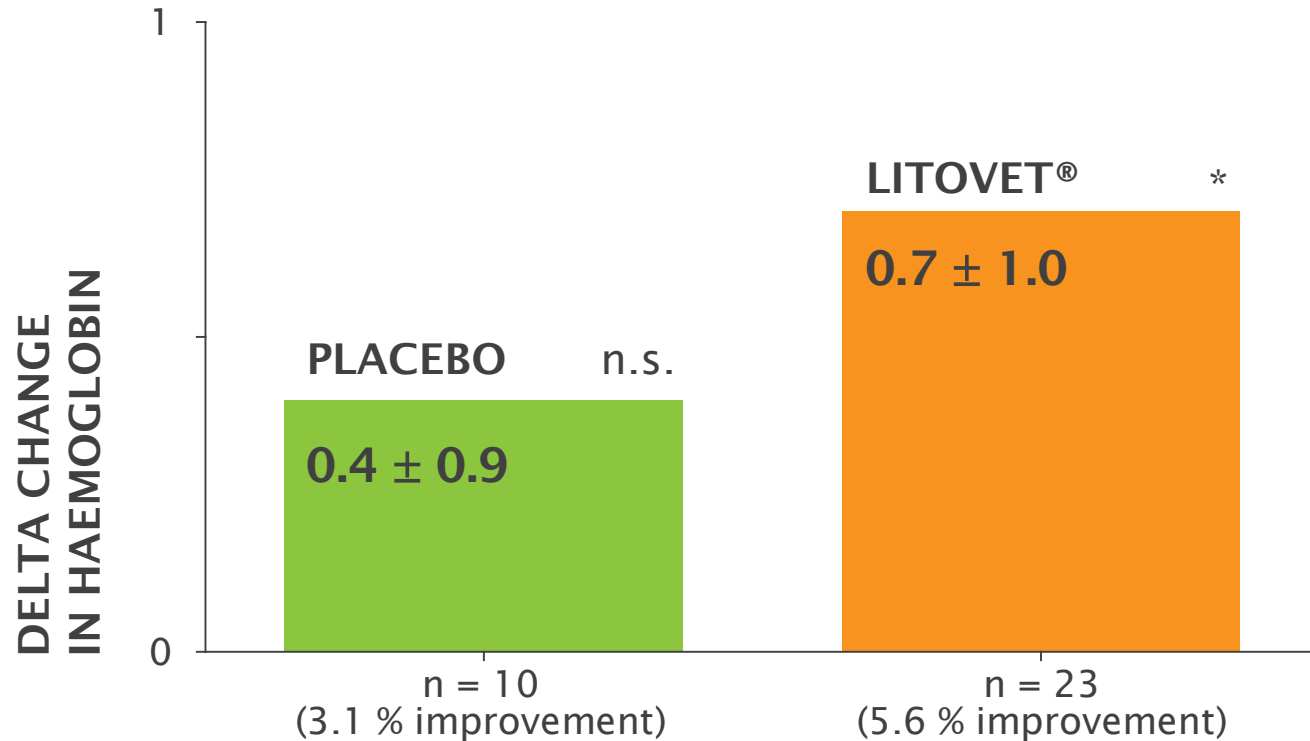
# NEUTROPHILE LEUCOCYTES CHEMOTAXIS IN HORSES BEFORE AND AFTER 3 MONTHS TREATMENT WITH LITOVET® (0.5 g/kg) AND AGAIN 3 MONTHS AFTER WITHDRAWAL OF THERAPY.



LITOVET® resulted in a significant reduction in chemotaxis (\* p<0.004). Three months after withdrawal this reduction was reduced by 50%.

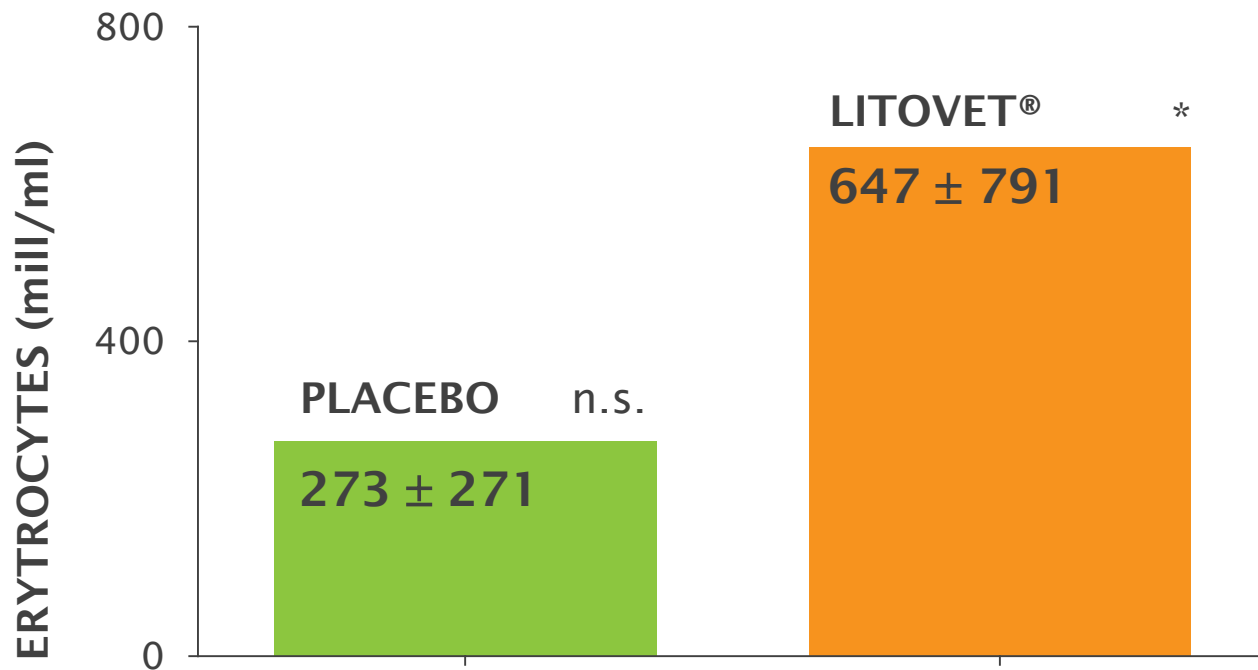


# DELTA CHANGE IN HAEMOGLOBIN CONCENTRATION IN HORSES DURING 3 MONTHS TREATMENT WITH LITOVET® (0.5 g/kg).



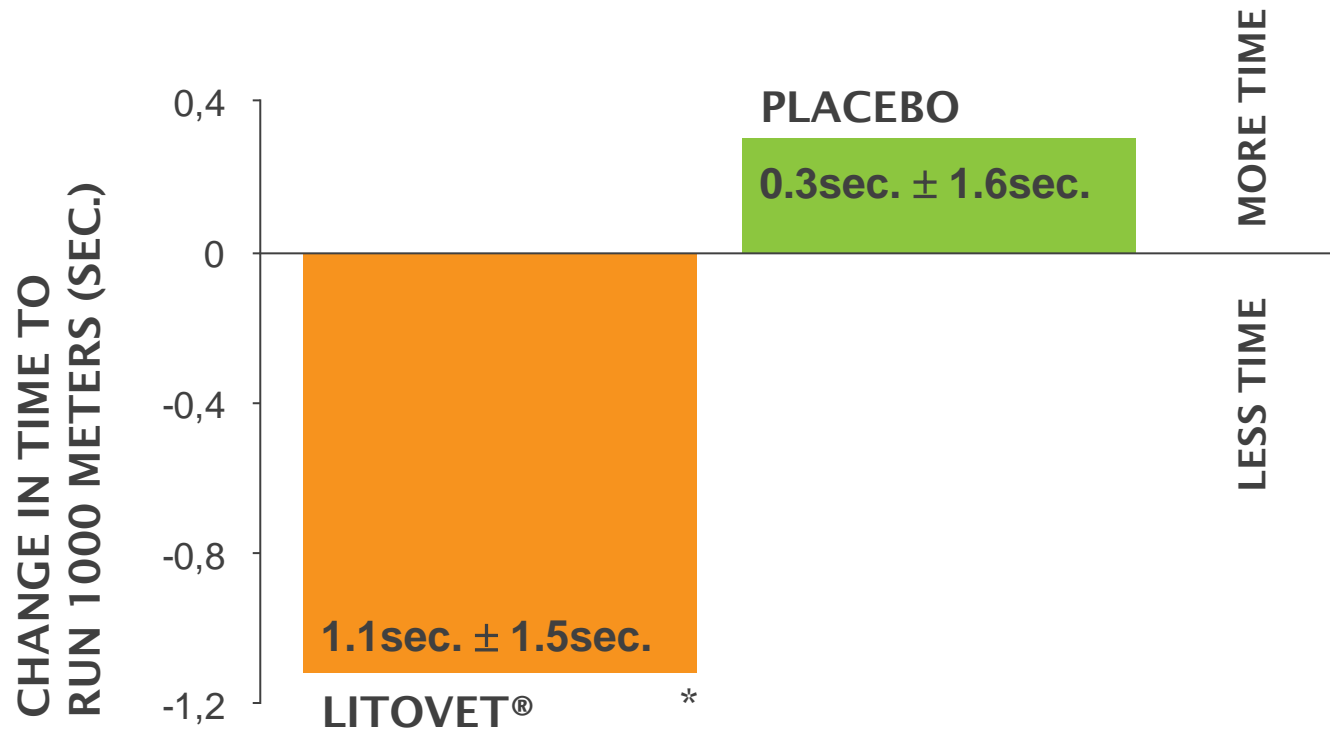
LITOVET® treatment resulted in an improvement in haemoglobin (\* p<0.002).

## DELTA CHANGE IN ERYTHROCYTE COUNTS IN HORSES DURING 3 MONTHS TREATMENT WITH PLACEBO OR LITOVET® (0.5 g/kg).



LITOVET® treatment resulted in an improvement in the counts of erythrocytes (\*  $p < 0.0001$ ).

## DELTA CHANGE IN TIME TO RUN 1 000 METERS. HORSES TREATED WITH LITOVET® OR PLACEBO.



During LITOVET® treatment the horses improved their speed  
(\*  $p < 0.02$ ).

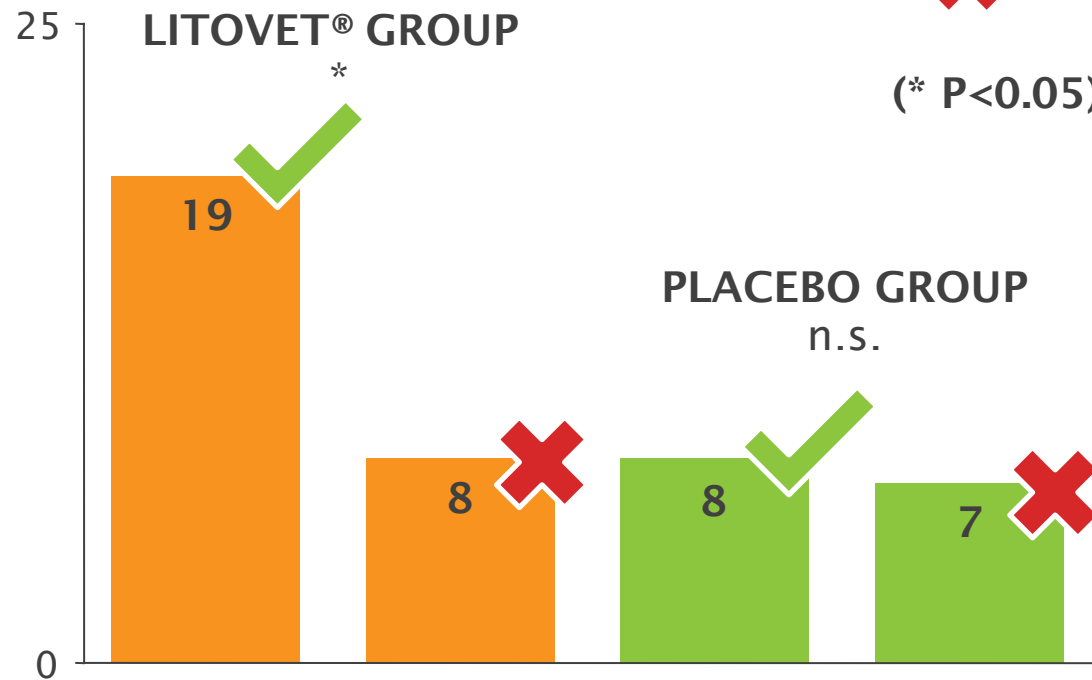
## HAEMATOLOGY AND TIME TO RUN 1 000 METERS. HORSES ON LITOVET® OR PLACEBO.

	LITOVET®		Placebo	
	before treatment	after treatment	before treatment	after treatment
Haemoglobin (mmol/l)	12,5 +/- 1.1	13.2 +/- 1.1	12.6 +/- 1.3	13.0 +/- 1.3 (ns)
Erythrocyte count (mill/ml)	8059 +/- 729	8652 +/- 769	8129 +/- 786	8302 +/- 938 (ns)
Time for running 1000 meters (min)	1.18.3 +/- 2.6	1.17.2 +/- 2.4	1.17.0 +/- 2.1	1.17.3 +/- 2.3 (ns)

In the LITOVET® group haemoglobin concentration and erythrocyte count improved significantly respectively and the time to run 1 000 meters declined. No significant change was observed in the group receiving placebo.

# ARE THE HORSES MORE LITHE AFTER STRENUOUS EXERCISE ?

- ✓ Yes or possibly yes
- ✗ No or absolutely not



In the LITOVET® group there was a significant number of positive statements. This was not observed in the placebo group

# BEHAVIOUR OF HORSES ON LITOVET® OR PLACEBO

**One question was: Have the horses changed their behaviour ?**

- 1) A change in behaviour was registered in 10 horses treated with LITOVET®
  - 2) A change in behaviour was registered in 5 horses treated with placebo
- (No significant change between the two groups)

## **1** Change in horses on LITOVET®

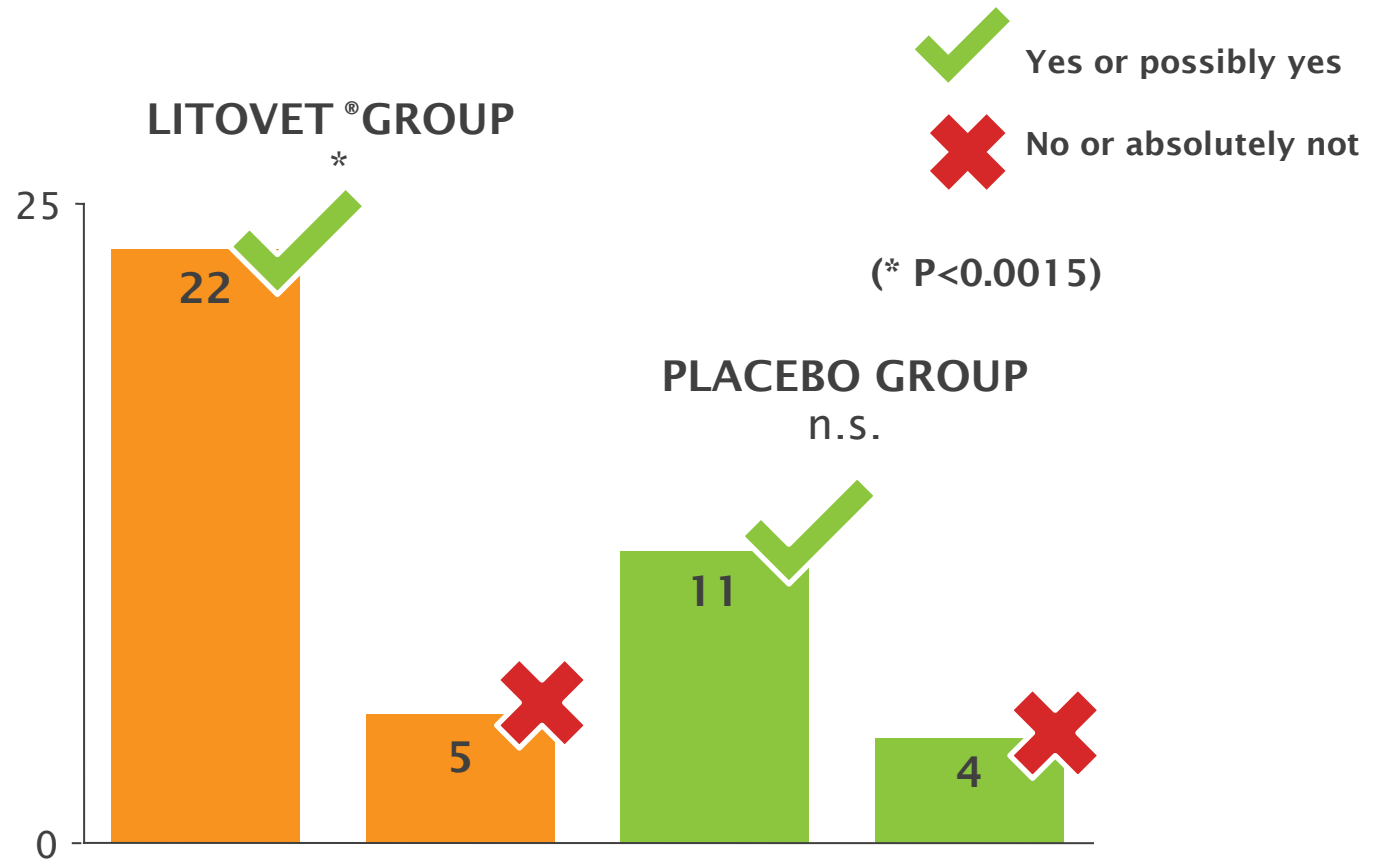
To the better/To the worse  
10/0 -  $p < 0.002$   
2 horses collaborated better  
2 horses were more lithe  
2 horses had more energy  
1 horse just felt better  
1 horse worked better  
1 horse just looked better  
1 horse was more lively

## **2** Change in horses on placebo

To the better / To the worse  
3/2 - n.s.  
1 horse was less stiff  
1 horse could work longer  
1 horse was more keen  
1 had problems with legs  
1 had more pain after training

In general, a more positive behaviour was reported in horses on LITOVET®

# DID THE HORSES BENEFIT FROM TREATMENT ?



In the LITOVET® group there was a significant number of positive statements. This was not observed in the placebo group.

## HORSES AND VITAMIN C

In contrast to humans, horses are able to synthesise vitamin C from their daily diet.

However, horses under strenuous exercise end up with Vitamin C depletion, which weakens the immune system.

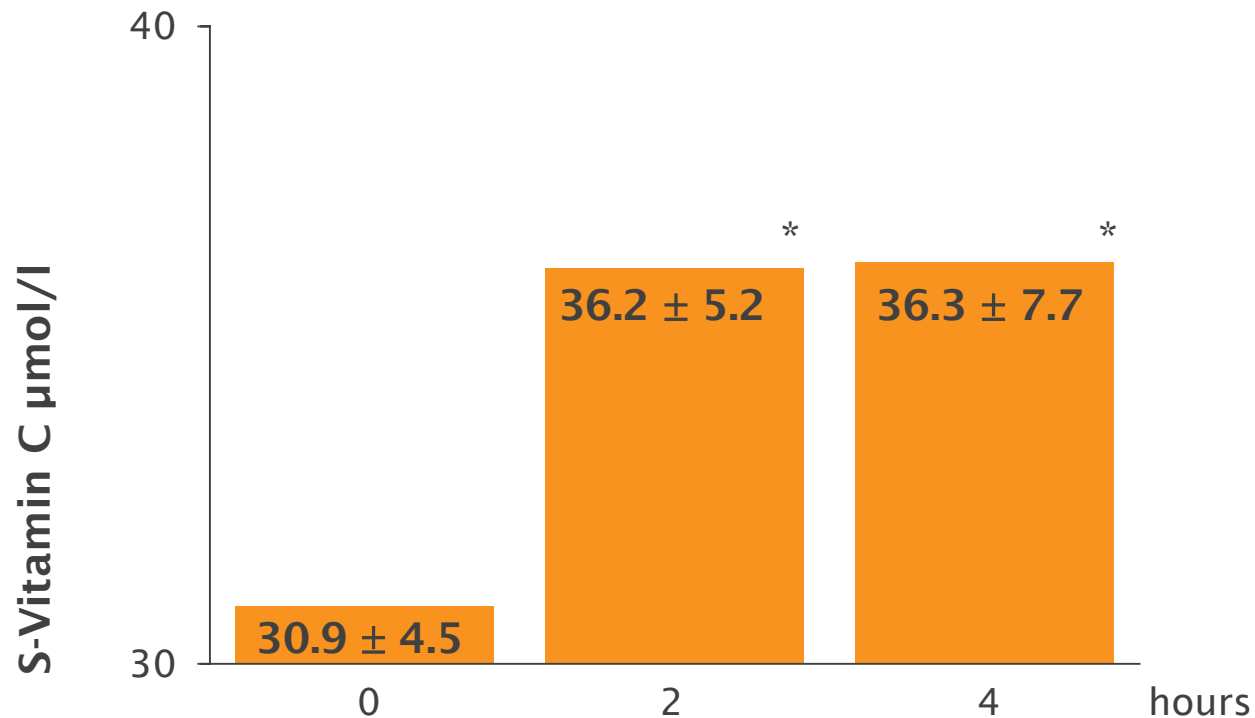
The addition of synthetic vitamin C to the diet of horses has not been successful as it results in poor and slow absorbance (> 3 weeks).

Natural vitamin C from LITOVET® is easily and quickly absorbed by horses.

Snow D. H. et aliteri: Oral administration of ascorbic acid to horses.  
Equine Veterinarian Journal (1987) 19 (6), 520-523

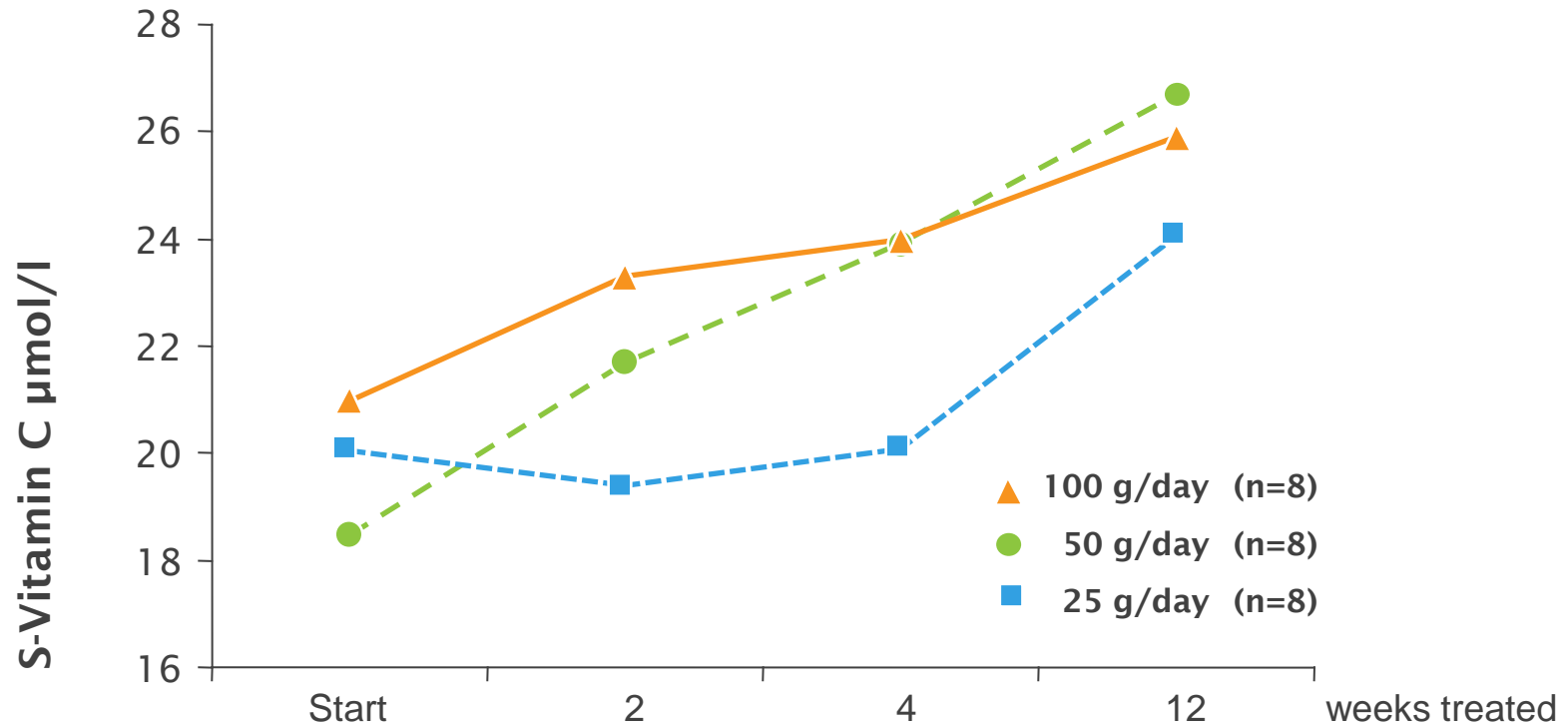


## VITAMIN C CONTENT IN HORSES TREATED WITH LITOVET® (200 G) FOR 2 AND 4 HOURS

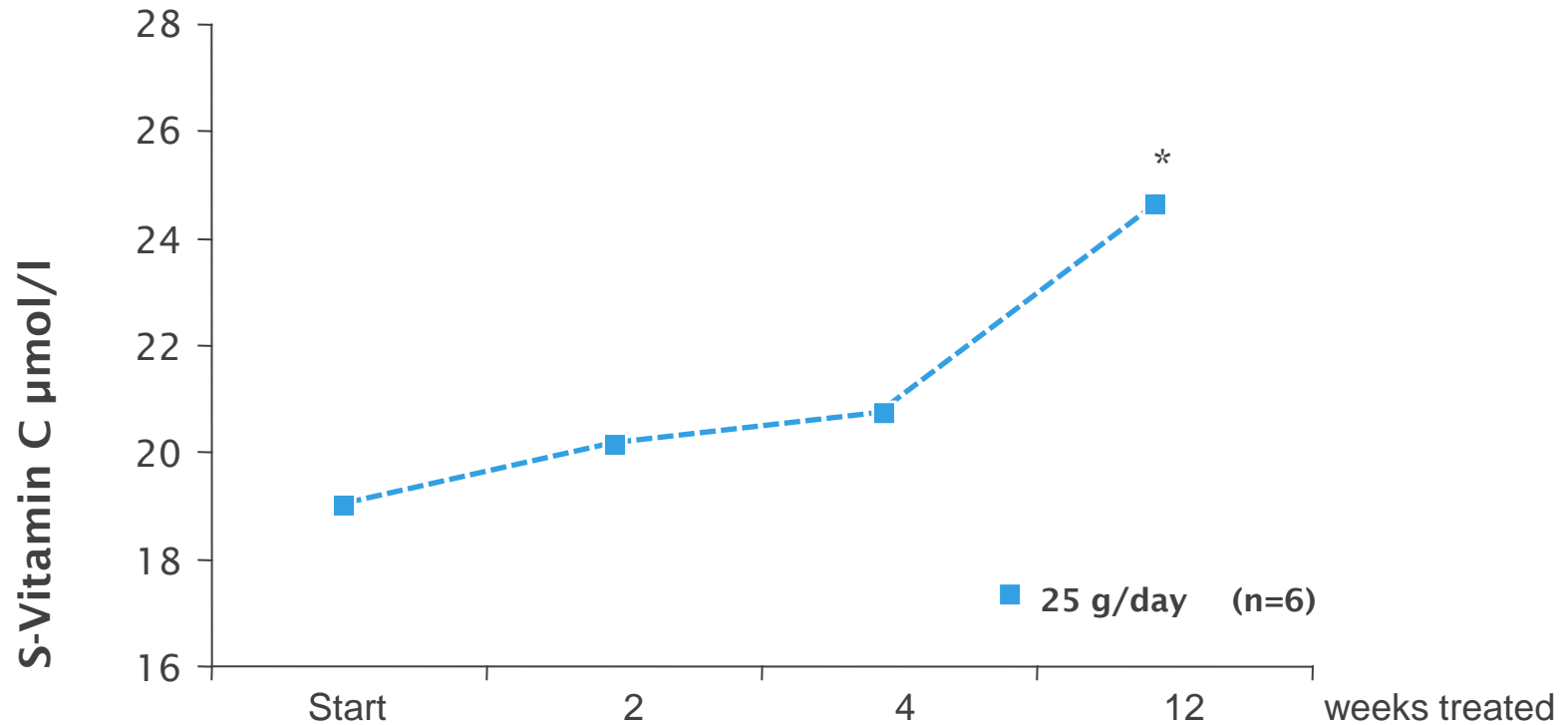


A significant increase in vitamin C was observed in blood drawn from horses after 2 and 4 hours ( $p < 0.05$ ). Two horses with low vitamin C levels increased their vitamin C level by 40% in the same time period.

# VITAMIN-C LEVELS IN HORSES FOLLOWING INTAKE OF LITOVET®



# VITAMIN-C LEVELS IN HORSES WITH INITIALLY LOW LEVELS OF VITAMIN-C (14.9 - 23.1 $\mu\text{mol/l}$ ) FOLLOWING DAILY INTAKE OF 25 GRAM LITOVET<sup>®</sup>



\*  $p < 0.031$

## CONCLUSION

LITOVET® has anti-inflammatory properties in horses. This can possibly explain why the horses, while on LITOVET®, were more lithe after training intensively, why the haemoglobin concentration increased and why the horses improved their speed during competition.

The addition of LITOVET® to the diet of horses strongly improved their blood level's of vitamin C.

