Immune effects and safety of an oral beta-1,3/1,6-glucans derived from yeast in racehorses

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Reasons for performing study

Intense training is recognized as a stress, which can significantly alter the immune function and, therefore, the susceptibility to disease. Beta-1,3/1,6-glucans are used in many species for their potent immunomodulating properties. So far, no data is available concerning the influence of oral beta glucans-1,3/1,6-supplementation on immunostimulation in horses.

The aim of that study was to assess the immunostimulating efficacy of an oral yeast-derived beta-1,3/1,6-glucans supplementation by comparing a vaccination response in racehorses during a competition period.

Materials and Methods

The study design was a double blinded placebo controlled trial following the experimental schedule shown on Graph 1. Forty-two competing Standardbreds were randomly assigned in a beta glucans group (n=21, 5 g MacrogardTM/horse/day) or in placebo group (n=21, carriers only) during a 90 days supplementation period.

At D0, D45 and D90, measurements were recorded including:
- morphometric measurements (body weight, body condition score),
- haematobiochemical variables (blood cells, muscular, liver and kidney enzymes),
- physiological variables at exercise (V4, V200, racing performance),
- immune variables (WBC counts, IgG).

After 47 days of supplementation, all horses were vaccinated against rabies (Rabisin ND) and three weeks after the horses received the booster. The vaccination responses were evaluated on D45, D68 and D90 by FAVN [Fluorescent Antibody Virus Neutralisation]. An ANOVA for repeated measurements was calculated, with a significance level of 5%.

Results

On D90, thirty two horses completed the experimentation. The vaccination response was significantly higher in the beta glucans group (n=16) compared to placebo group (n=16) (p < 0.05) (Graph 2) but serum IgG levels and white blood cells counts were similar in both groups.

No adverse event was observed in any group and all others variables assessed for safety were similar in beta glucans and placebo groups.

Discussion

The main result was a significant improvement of vaccination response in supplemented horses compared to control group. Similar results have been reported in various species such as in aquaculture (Meena et al., 2013), poultry (Thanh Hoa et al., 2011), pigs (Wang et al., 2008) or dogs (Haladova et al., 2011).

In horses, one study reported the effects of beta -1,3/1,6-glucans on immunity of mares but they were injected IM (Kراكowski et al., 1999). In this study, the authors observed a significant increase of colostrum IgG and IgM in treated mares compared to control and also an improvement of non specific immunity of foals from mares immunostimulated.

Conclusions

Under these experimental conditions, the oral supplementation with beta glucans showed interesting immunomodulating properties as it significantly increased the vaccination response studied.

Moreover, this long term supplementation appeared safe.