

EFFECTS OF IMMUNOSTIMULANTS ON SURVIVAL OF NILE TILAPIA (*OREOCHROMIS NILOTICUS*) AFTER *STREPTOCOCCUS AGALACTIAE* CHALLENGE

^{1,2}Kim.N.T. Tran ^{*}, ^{1,3}Arjen Roem, ²Thinh.H. Nguyen, ¹Johan.A.J. Verreth

Introduction

We wanted to study the effect of two immunostimulants on performance and survival of tilapia after a disease challenge. Products tested were:

- Glucan Plus an immunostimulant combining 1,3 – 1,6 β -glucan and essential oil (Skretting ARC, Stavanger, Norway).
- PresanTM-FX a blend of phenolic compounds, butyrate, slow release C12, MCFAs and organic acids (Selko, Tilburg, The Netherlands).

Objectives

To test the effects of Glucan Plus and PresanTM-FX on tilapia:

1. Growth performance and plasma immune status
2. Survival after *Streptococcus* challenge.

Materials and methods

Experimental conditions

45 Nile tilapia (50 g) x 3 diets x triplicate tanks fed restrictively for 10 weeks.

Dietary treatments:

1. basal diet (30% crude protein, 8% fat)
2. basal diet + 0.1% Glucan Plus
3. basal diet + 0.2% PresanTM-FX



After 10 weeks 28 fish were selected from each tank for a challenge by immersion in 10^9 CFU/ml *Streptococcus agalactiae* for 1 hour. Survival rate is monitored for 14 days post-challenge.



Sample collection techniques and analyses

Mean weight gain, SGR, FCR and feed intake were assessed at week 10. At week 2, 6, 10, 11 and 12, 2 fish per tank were sampled for WBC counts and lysozyme activity. One-way Anova and Duncan's for statistics.

Results

Figure 2. Growth performance parameters of Tilapia after 10 weeks of feeding the 3 diets. Significant differences ($P < 0.05$) are indicated by different letters.

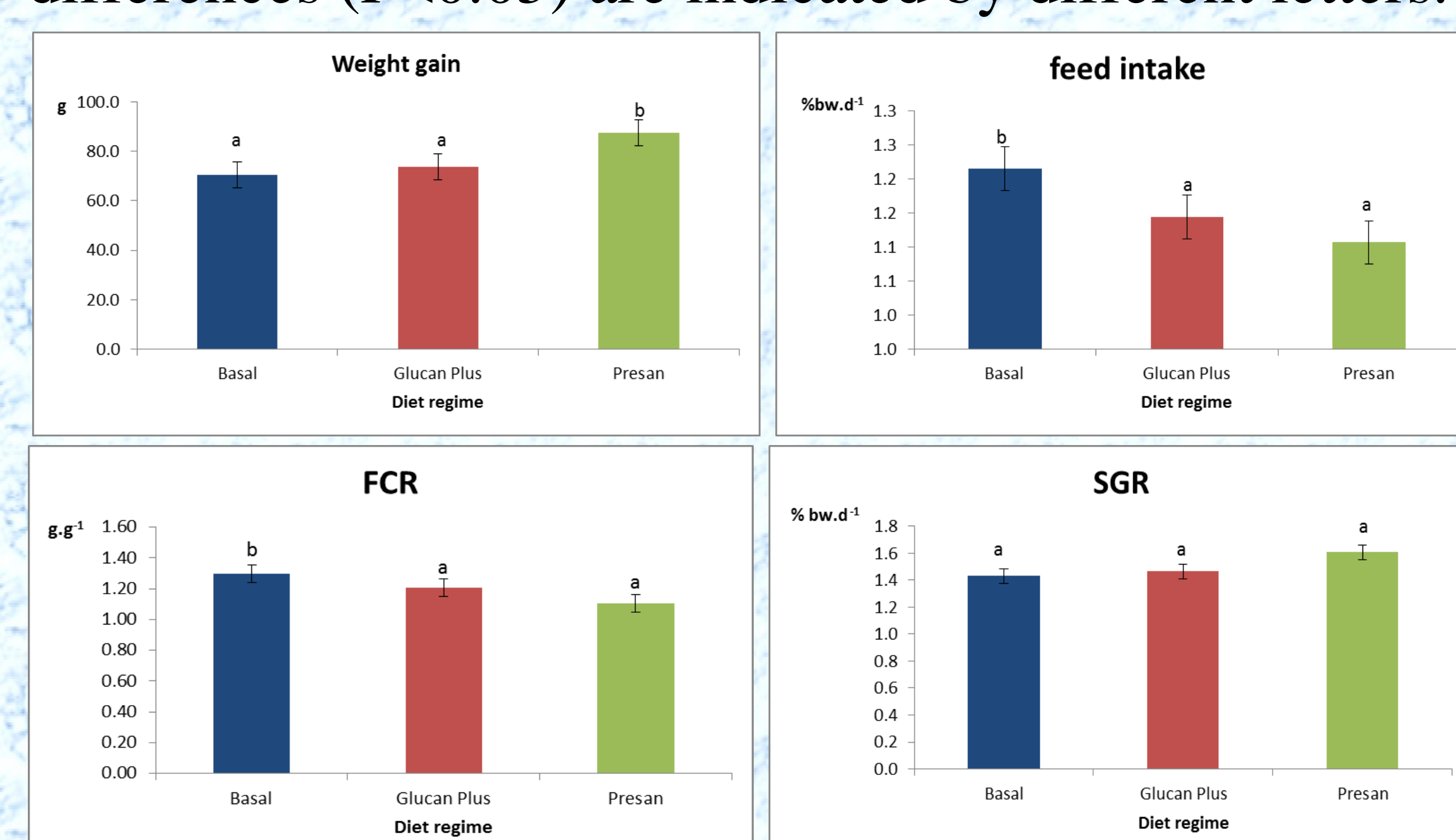
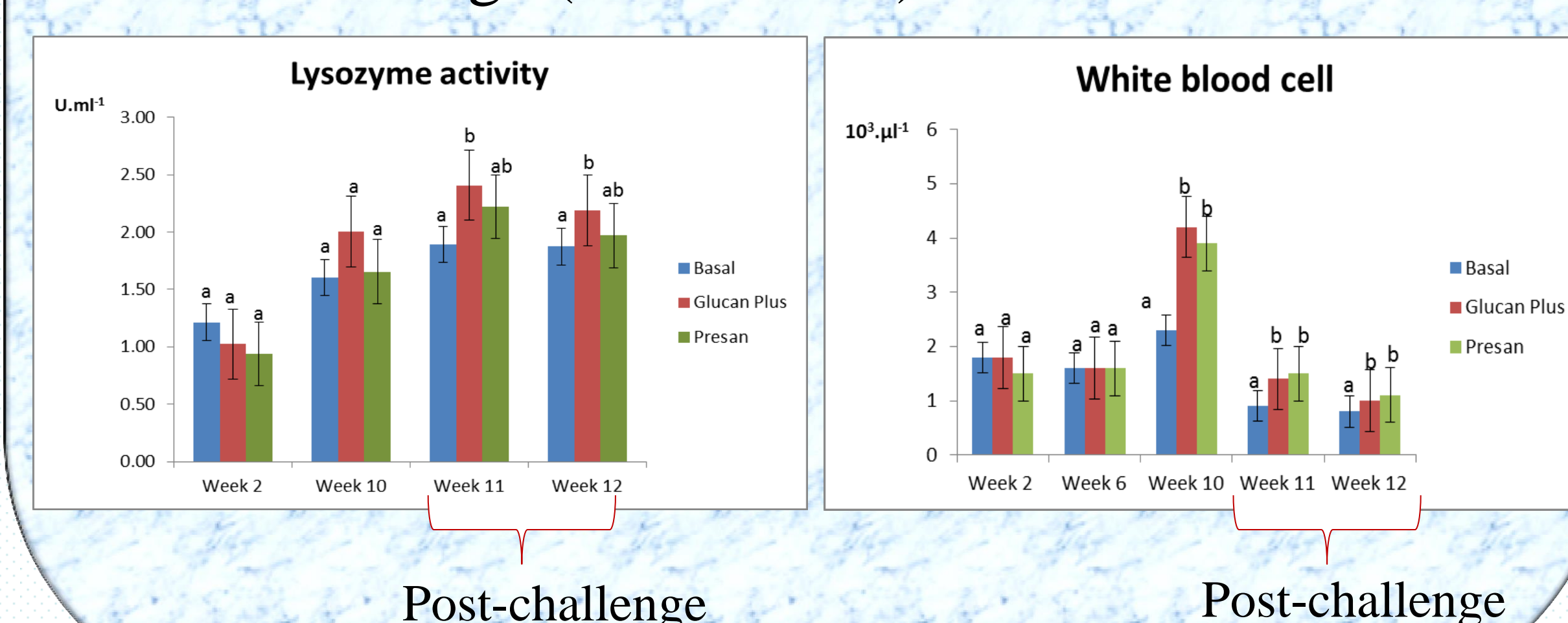


Figure 3. Plasma immune parameters of Tilapia during 10 weeks (week 1-10) of feeding and 2 weeks post bacterial challenge (week 11-12)



Results

Table 1. Survival rate and relative percent survival (RPS) of Tilapia challenge against 1.6×10^9 CFU/ml.

Post-challenge	Basal diet	Glucan Plus	Presan diet
Survival rate (%)	47.2 \pm 12.73 ^a	83.33 \pm 8.35 ^b	69.43 \pm 12.72 ^{ab}
RPS (%)	-	68.6 \pm 12.76 ^a	41.40 \pm 23.59 ^a

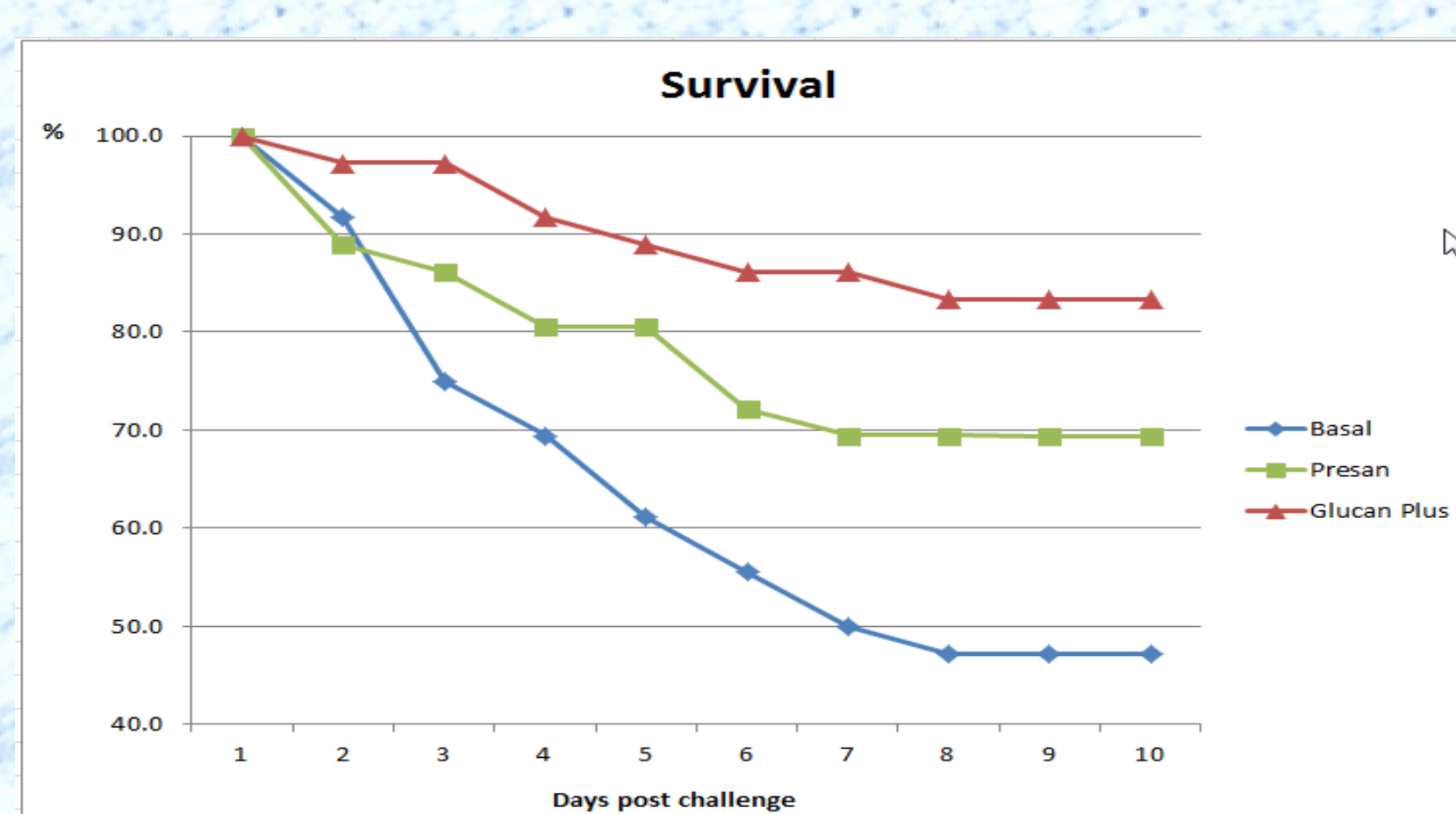


Figure 1. Daily survival of Tilapia challenged with *S. agalactiae*

Conclusions

1. Glucan Plus improved survival of Nile tilapia significantly after a challenge of *Streptococcus agalactiae*. PresanTM-FX also seemed to improve survival but this tendency was not significant.
2. PresanTM-FX improved mean weight gain and FCR significantly, while feed intake as percent of body weight was reduced.
3. Glucan Plus increased lysozyme activity significantly post-challenge. Both Glucan Plus and PresanTM-FX increased WBC count after 10 weeks and this effect was maintained after the challenge.

