3.4. Evaluation of the intestinal absorption of insulin-loaded nanoparticles by everted gut sac model

In normal rat, insulin at a concentration of 1 IU/ml was seen absorbed in a time dependent manner in its solution form. After 60 min of incubation, it was noted that the highest concentration of insulin in the serosal part was 7134 µIU/ml and it was highly significant ($p < 0.001$). On the other hand, insulin loaded nanoparticles (7 IU/ml) showed a different trend. It was observed that less amount of insulin was transferred into the serosal area. The difference in absorption between initial two time intervals namely, post 20 and 40 minutes was insignificant ($p > 0.05$). However, after 60 minutes of incubation it was noted that the amount of the absorbed insulin increase significantly ($p < 0.05$) (Figure 3.7).

Intestinal absorption profiles in diabetic rat showed very small absorbed insulin at all interval time with oral insulin formula and the difference in absorption was insignificant ($p > 0.05$), while the uptake profiles with Rh-insulin solution showed larger absorption especially at 40 min ($p < 0.05$). (Figure 3.8)

The sampling is continued for 60 min and found that the concentration of insulin absorbed is more in the standard insulin formula in all cases (normal and diabetic rat). After 20, 40 and 60 min the amount of absorbed insulin were 1976, 3729, 7134 µIU/ml respectively in normal rats and 7388, 19675, 8275 µIU/ml respectively in diabetic rats, where in oral insulin formula the absorbed insulin was 369, 520, 2270 µIU/ml respectively in normal rats and 233, 138, 146 respectively in diabetic rats.