



# IU Football Team Analysis

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### Introduction

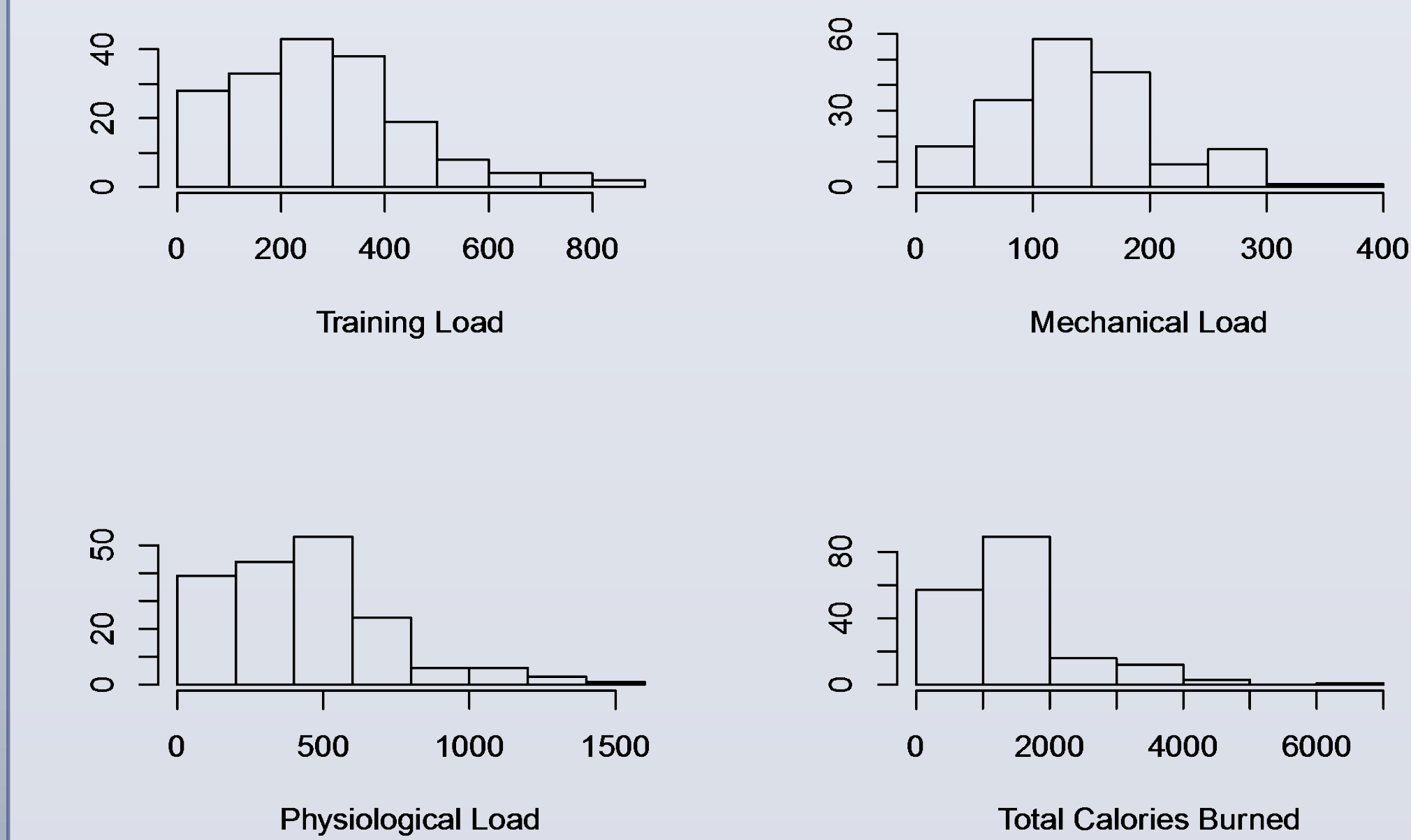
This project is for IU Football team. In our report, we would analyze data of different positions and create models and plots to show relationships among data.

In our team, we are concentrated on analyzing the relationships between weekdays and four different factors for different positions before Iowa game and after Iowa game. The factors that we decided to work on are Mechanical load, Training load, Calories and Physiological load.

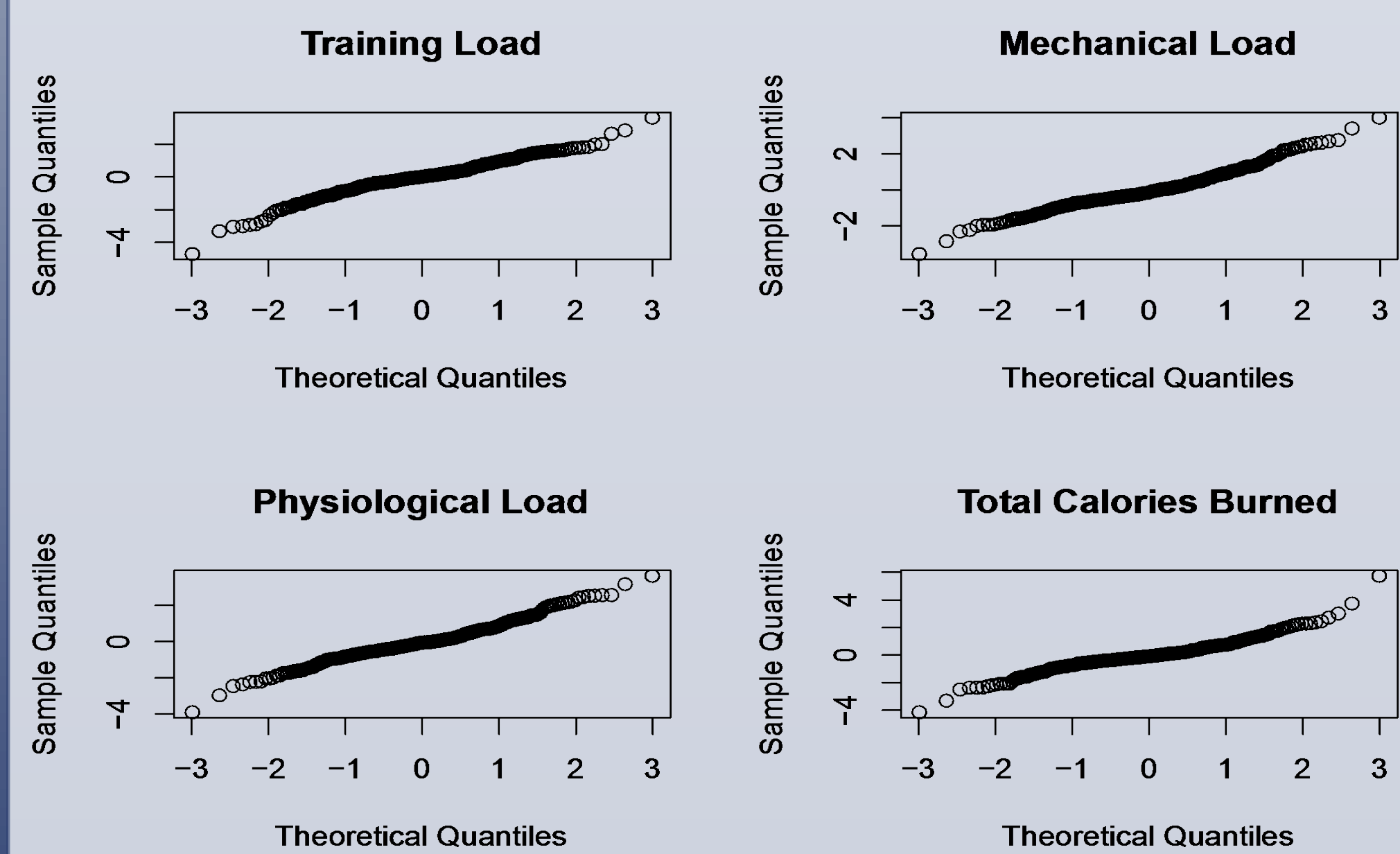
First, we try to use histograms and qq-norm plots to figure out those model whether they are nearly linear or not. Then we focus on boxplot to find influence of different days. At last, we use summary table and anova to find whether different positions and different weekdays before Iowa or after Iowa are important for Mechanical load, Training load, Calories and Physiological load or not.

### Analyze

We choose four variables to check their relationship with different position and different weekdays before Iowa and after Iowa. The reason why we choose these four variables because we think they are main physical effect that can show players' situation.

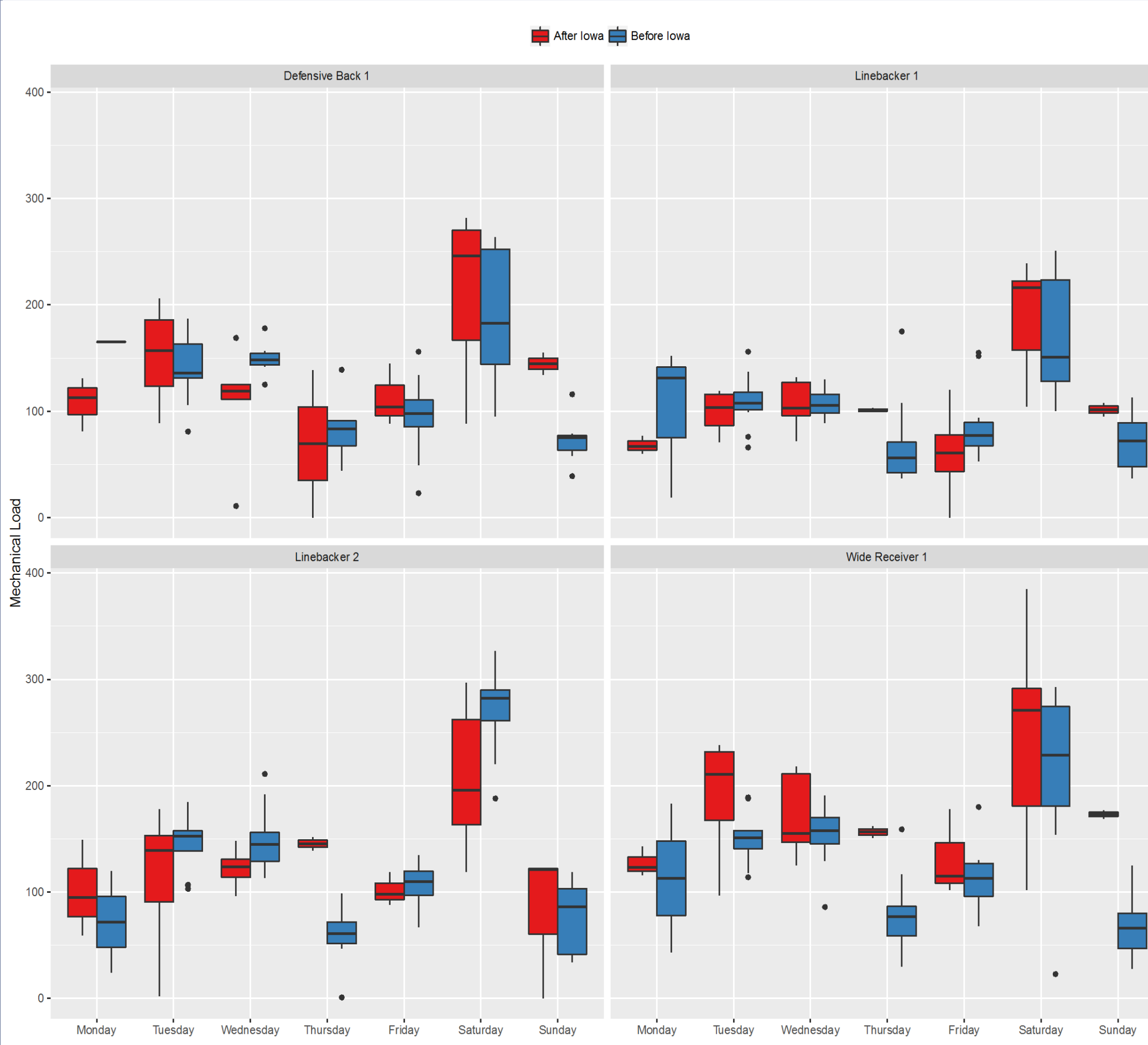


From the histograms of different model, we can see that all those four model are skewed. So our group explore more about details of those models to analyze their relationship.



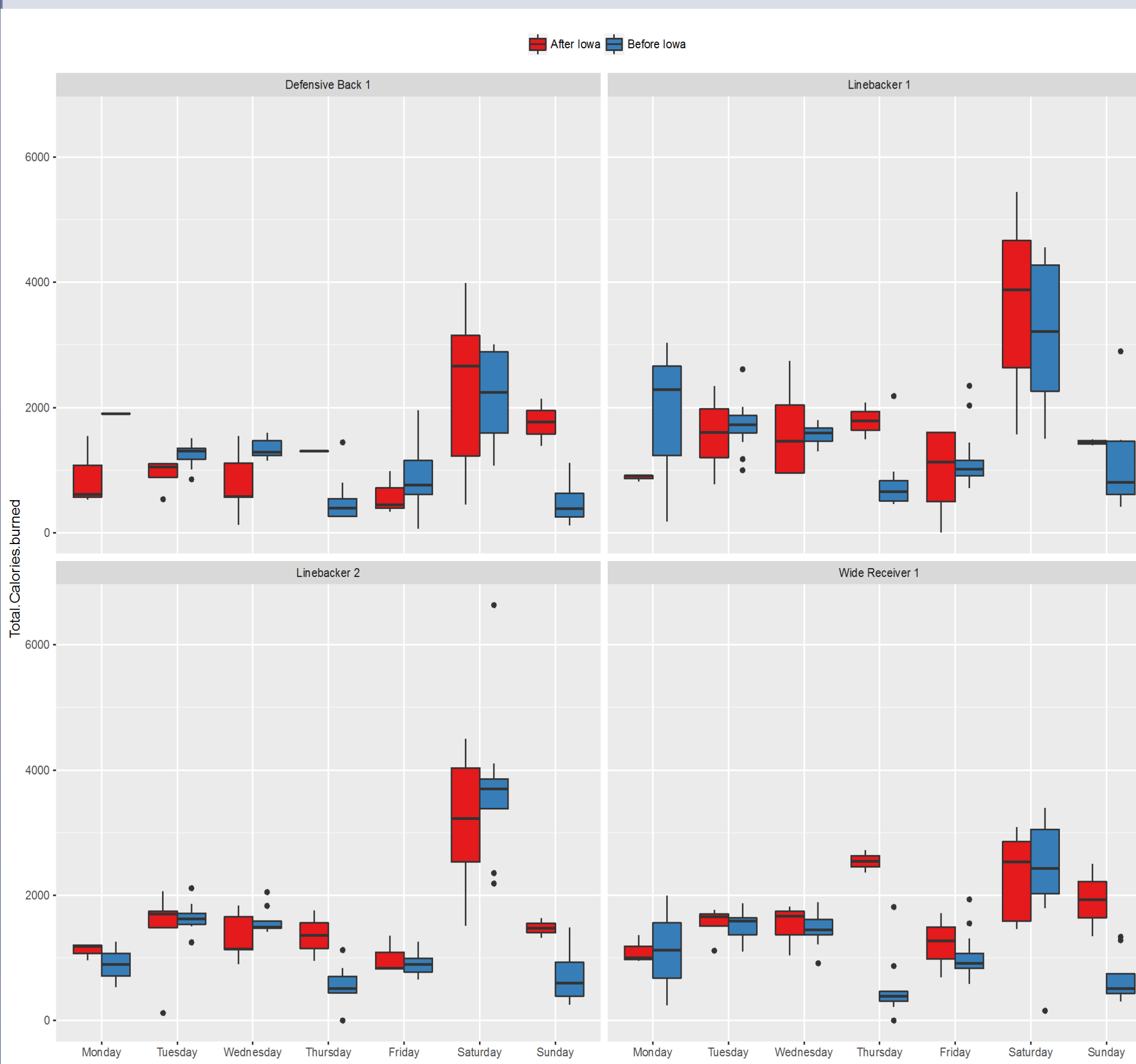
For the QQ-norm plots, we can see that even though they are not the best linear model. But they are kind of linear. So we will focus on more details about models.

Infection of mechanical load before Iowa and after Iowa



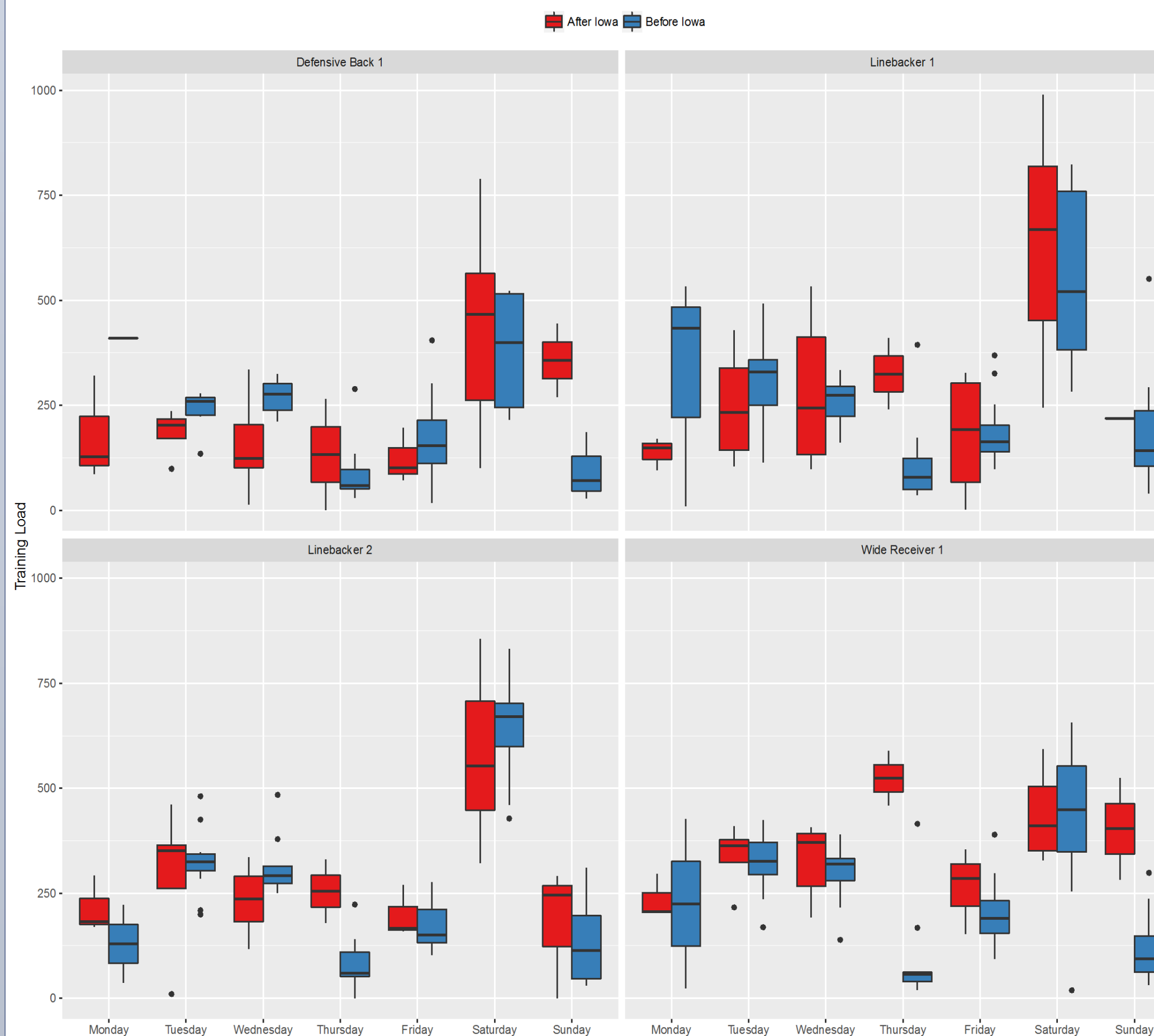
For this boxplot with weekdays before Iowa and after Iowa and mechanical, we can see that for different position each days before Iowa and after Iowa have different effect. We will prefer both upper and lower lines are close to middle line which means they are more concentrate on the average. So for defensive backer1 we will suggest they train after Iowa game on Wednesday and Sunday. For line backer 1, we will suggest them to train on Monday, Tuesday, Friday and Sunday. For line backer 2, we will suggest they train on Thursday. Moreover, for wide receiver, we will suggest them to train on Thursday and Sunday.

Infection of total calories burned before Iowa and after Iowa



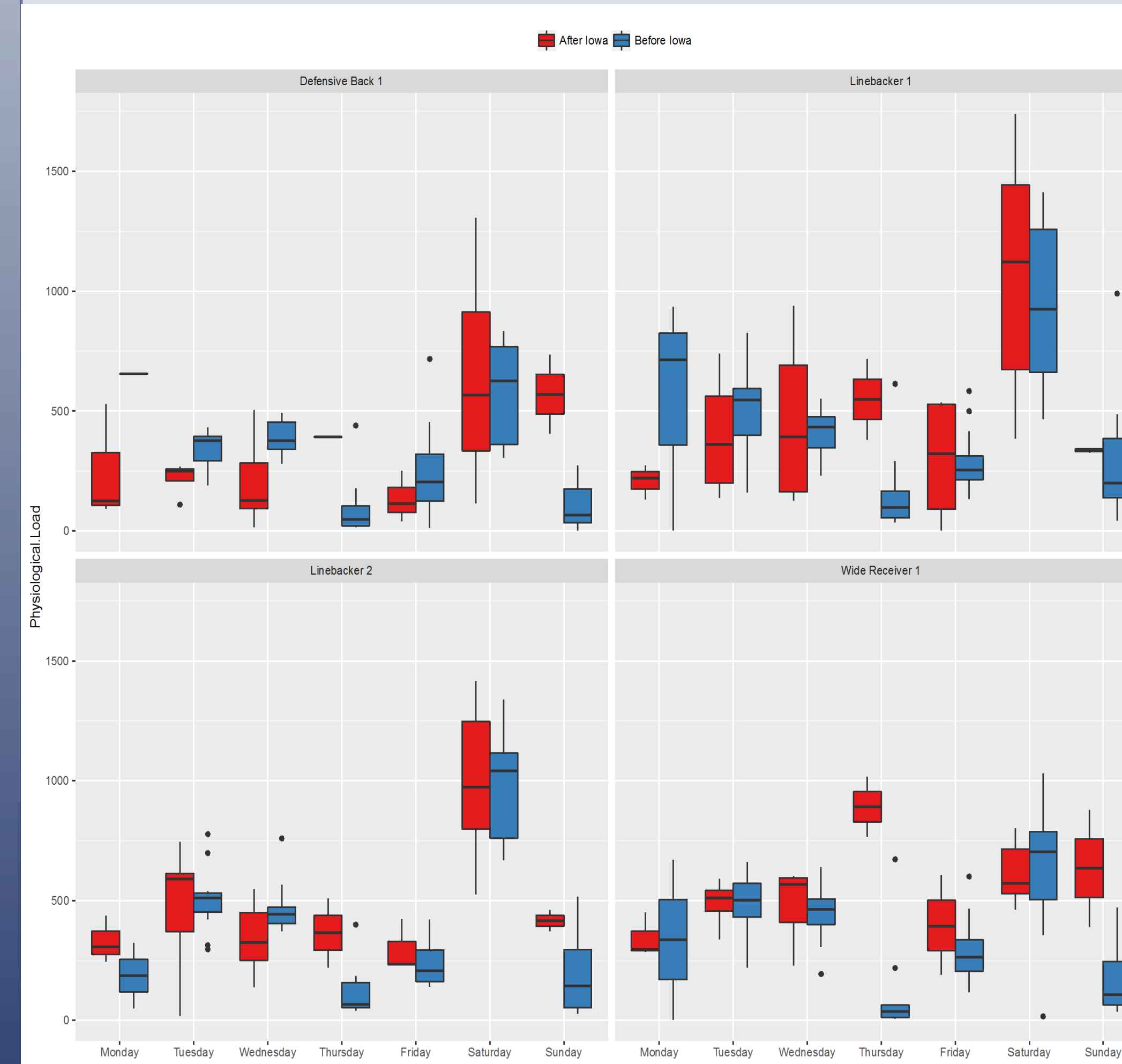
For this boxplot, we can see that we will prefer plot more symmetric. So we will suggest team to train line backer1 after Iowa on Sunday. For line backer1 we will suggest train on Monday and Sunday. For line backer 2, we will suggest team to train on Monday, Tuesday and Friday. And for wide receiver we will suggest team to train on Thursday, Friday and Sunday.

Inflection of training load before Iowa and after Iowa



When we analyze this boxplot, we will prefer plots more concentrate on the average. We will suggest defensive backer 1 after Iowa game train on Thursday and Sunday and will suggest line backer 1 to focus on training on Tuesday, Thursday and Sunday. We also want to suggest line backer2 to train on Wednesday and Thursday after Iowa game. More, we will suggest wide receiver to train on Thursday and Sunday.

Infection of physiological load before Iowa and after Iowa



For the last boxplot, we also prefer plots are more symmetric. So we will suggest defensive back 1 to train on Saturday and Sunday. For line backer 1 we will suggest to train on Tuesday, Thursday and Sunday. We will suggest line backer 2 to train on Thursday and Sunday. And for wide receiver, we will suggest to train on Thursday, Friday and Sunday after Iowa game.

After analyzing all boxplots, we focus on detail on summary tables and anova table on each models. In each summary tables we can see that different weekdays have different influence on models. Moreover, we can also see that different positions will have different result for models. So we can give suggestion for the team that for which days are benefit for which positions to train that team can get the best result.

For anova table, we can use F-test to find out whether different positions and weekdays before Iowa and after Iowa are important factors for Mechanical load, Training load, Calories and Physiological load. And check the p-values of this table, we can give the conclusion that which factors are more important for team.

### What we can get

For the whole project, we try to figure out the relationship between different positions and weekdays before Iowa and after Iowa with four variables Mechanical load, Training load, Calories and Physiological load. We can see that both factors at least have some influence for the model. Moreover, we can see different weekdays have different result for training. From our boxplots, we can give some suggestion for the team so that our team hope these suggestions can help our football team to become better.

