

Effect of grazing white clover pasture on milk composition of Holstein and Jersey cows

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Introduction

Because of its high saturated fatty acid (FA) content milk fat is considered hypercholesterolemic. Intake of unsaturated FA (UFA) reduces the plasma cholesterol concentrations. Especially conjugated linoleic acids (CLA) have shown positive effects on cardiovascular diseases, prevention of cancer and obesity. The aim of our project is to investigate how grazing can enhance the content of these beneficiary FA in milk.

Experimental design

7 Danish organic farms were selected for this study, 4 with Jersey cow herds and 3 with Holstein cow herds. In 2006 they established pastures with a mixture of raygrass and white clover, to ensure well established pastures for the study to be run in 2007. Time on pasture was established so that the effect of grazing on milk could be investigated and the ration was completed with total mixed ration (TMR). Milk samples were collected during two consecutive days in May and September after a one-week adaptation period on pasture. Milk samples were analyzed for fatty acid (FA) content.

Results and Discussion

FA analyses results of Holstein milk are presented on the left side and those of Jersey milk on the right side of the figure legends.

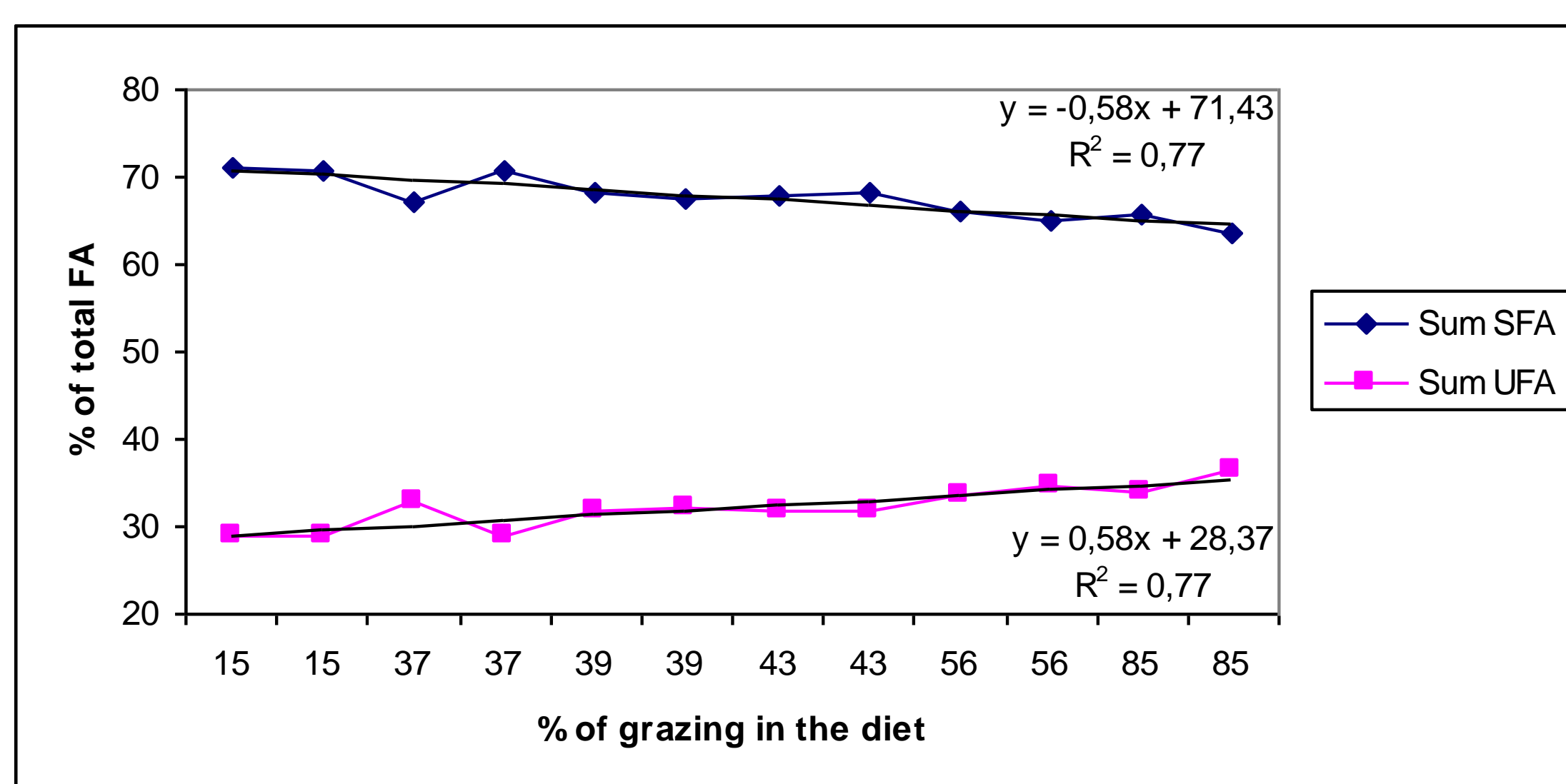


Fig.1: Content of saturated and unsaturated FA (respectively SFA and UFA). While Jersey milk FA composition is not influenced by the grazing percentage, there is a significant positive correlation between grazing and increase content of beneficiary FA in Holstein milk.

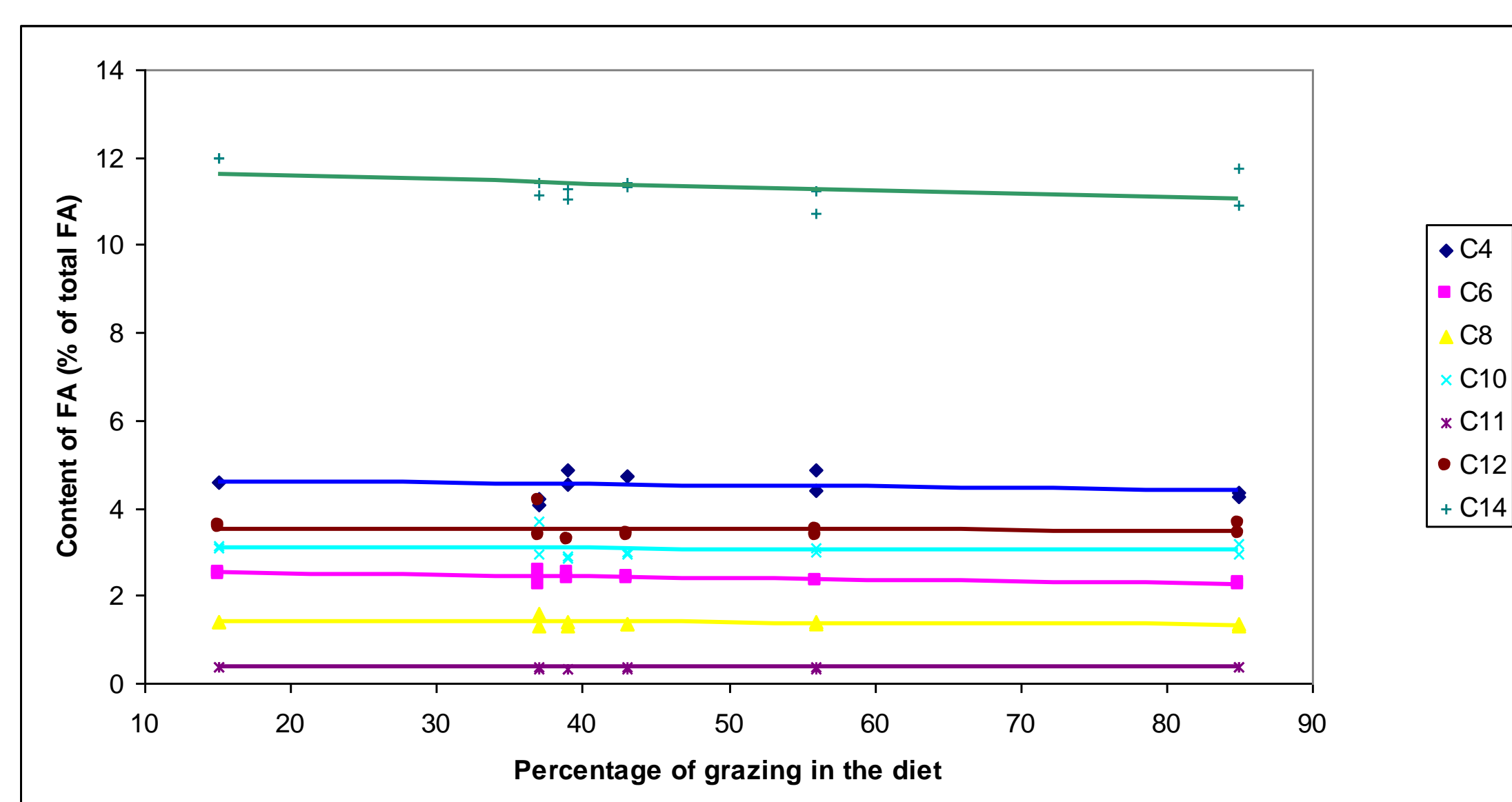
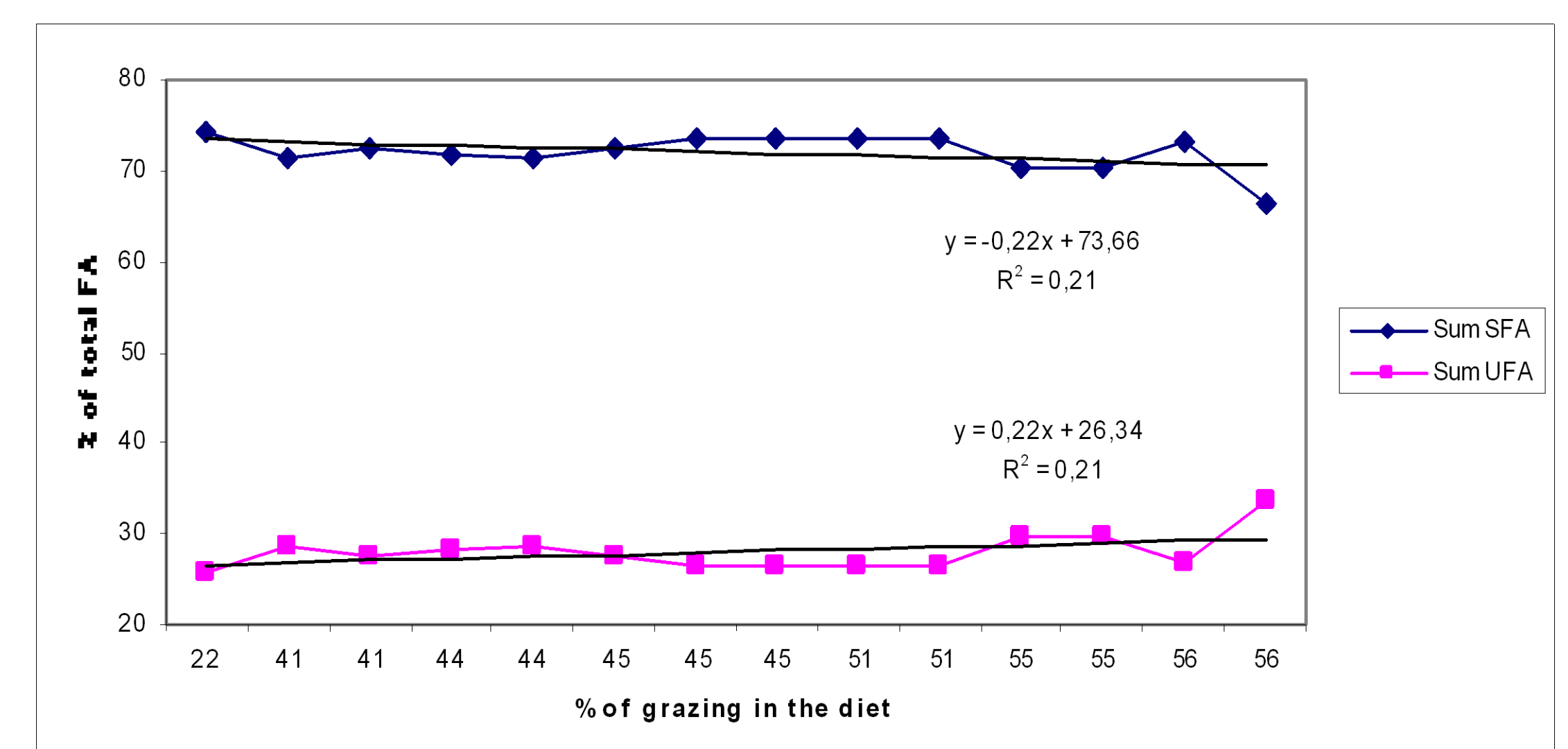


Fig.2: Content of short chain saturated FA. These FA in milk are mainly the result of *de novo* FA synthesis in the mammary gland. The results presented here show that the percentage of grazing in the diet does not affect the content of these FA in the milk. Therefore it can be assumed that the FA synthase activity is not influenced by this parameter.

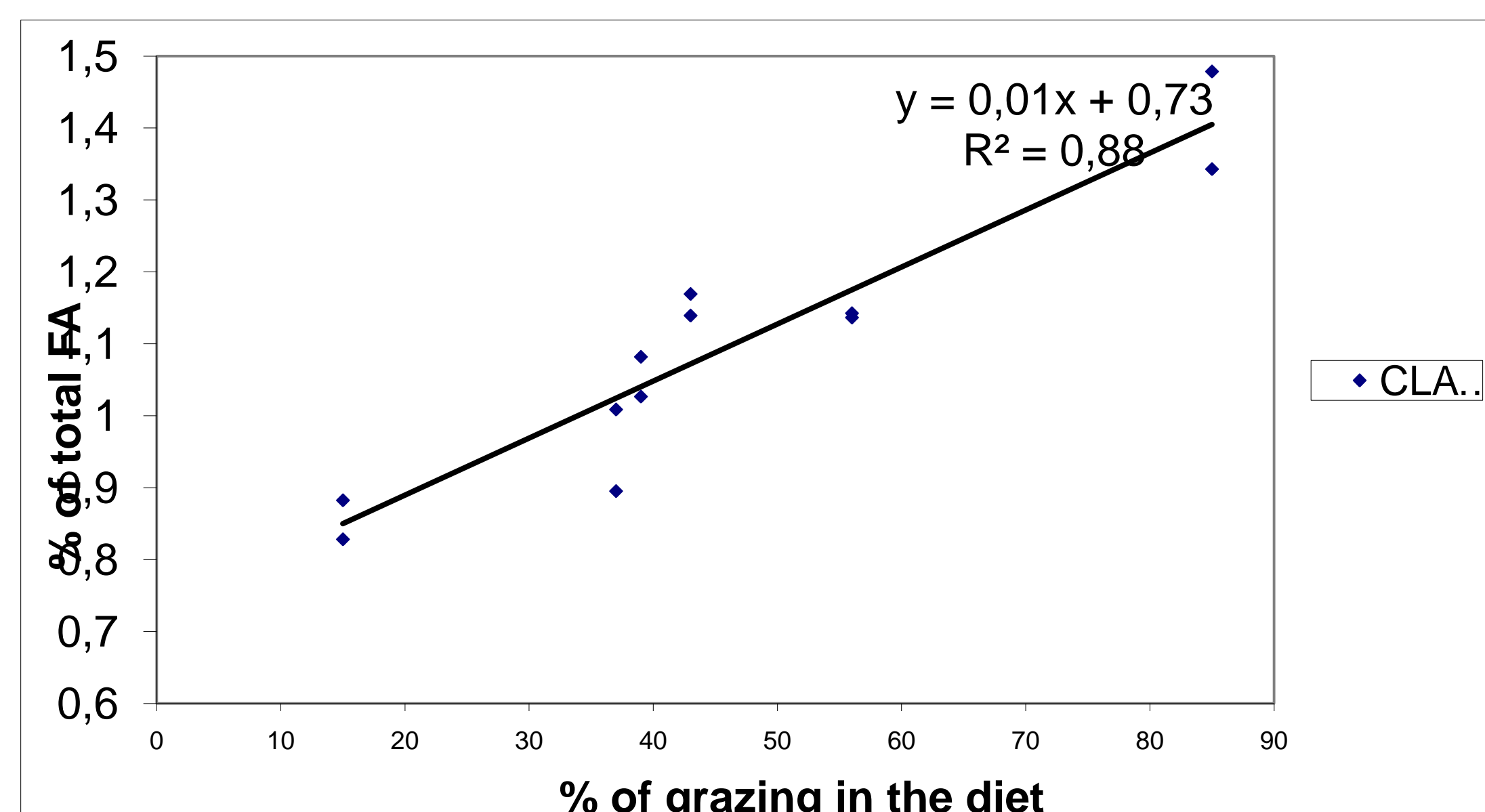
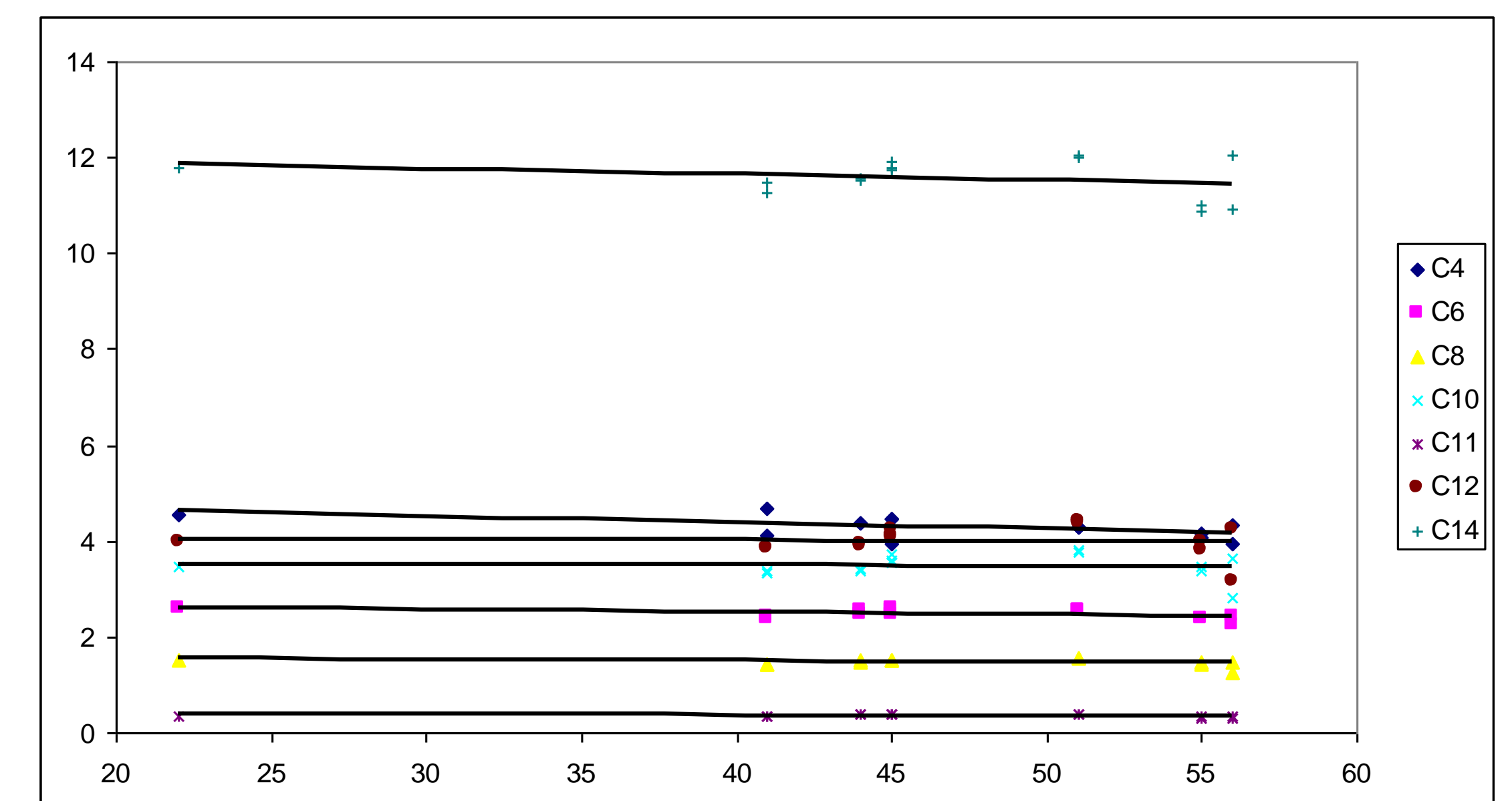
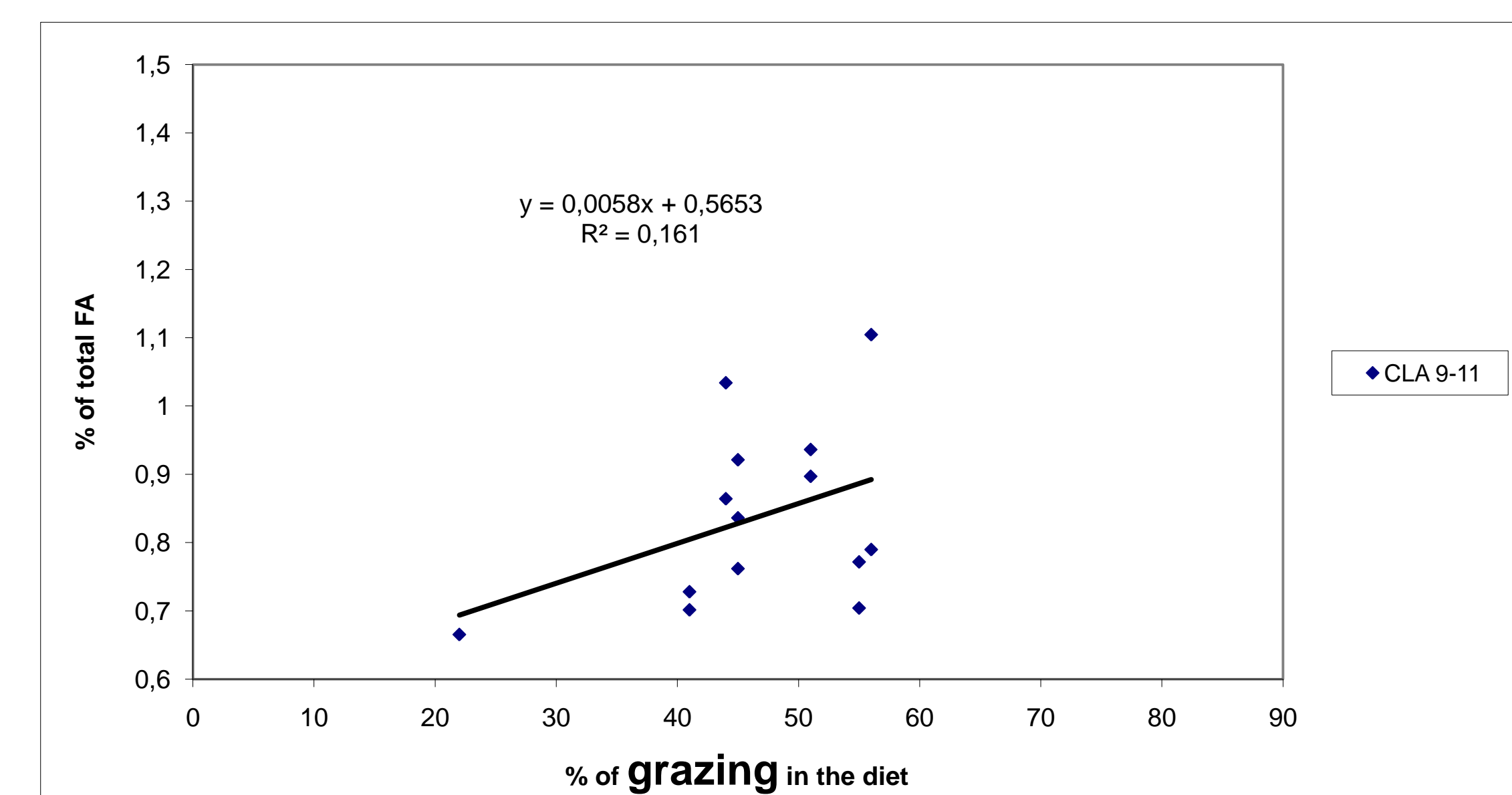


Fig.3: Content of CLA c9,t11. The graph on the left side clearly shows that the content of this FA in Holstein milk is highly correlated to pasture grazing. Milk produced by Jersey cows is not as much influenced by the percentage of grazing in the diet. These results suggest that these two races of cows have different mammary gland $\Delta 9$ -desaturase activities.



Conclusion

The present study confirms the positive effects of white clover pasture grazing on milk FA composition. Furthermore it demonstrates that the mammary FA synthesis of Jersey cows is not as positively affected by higher grazing ratios in the diet as it is for Holstein cows.