

Feed intake and milk yield responses to reduced protein supply

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Importance of protein in dairy cow nutrition



The cow:

Both too little and too much is bad

Too much – loss of energy

Too little – reduced digestibility and undersupply with amino acids

Environment:

Ammonia evaporation

Leak to groundwater and wet areas

Questions in this project:

- **How do cows respond to protein supply below requirements**
- **Do individual cows differ in response**

Experiments

- **2 experiments, repeated**
- **4 protein levels**
- **32 cows per exp., Latin square**
- **Block exp., parity and DIM**
- **Total 256 observations**
- **Period length 14 days**
- **Tie stall, milking twice daily**

Feeding and treatments



Ad lib. feeding, fed twice daily

Treatments:

4 protein levels

Exchange of dehulled soy bean meal with molasses and soy hulls



Treatments – ration DM composition (g/kg DM)

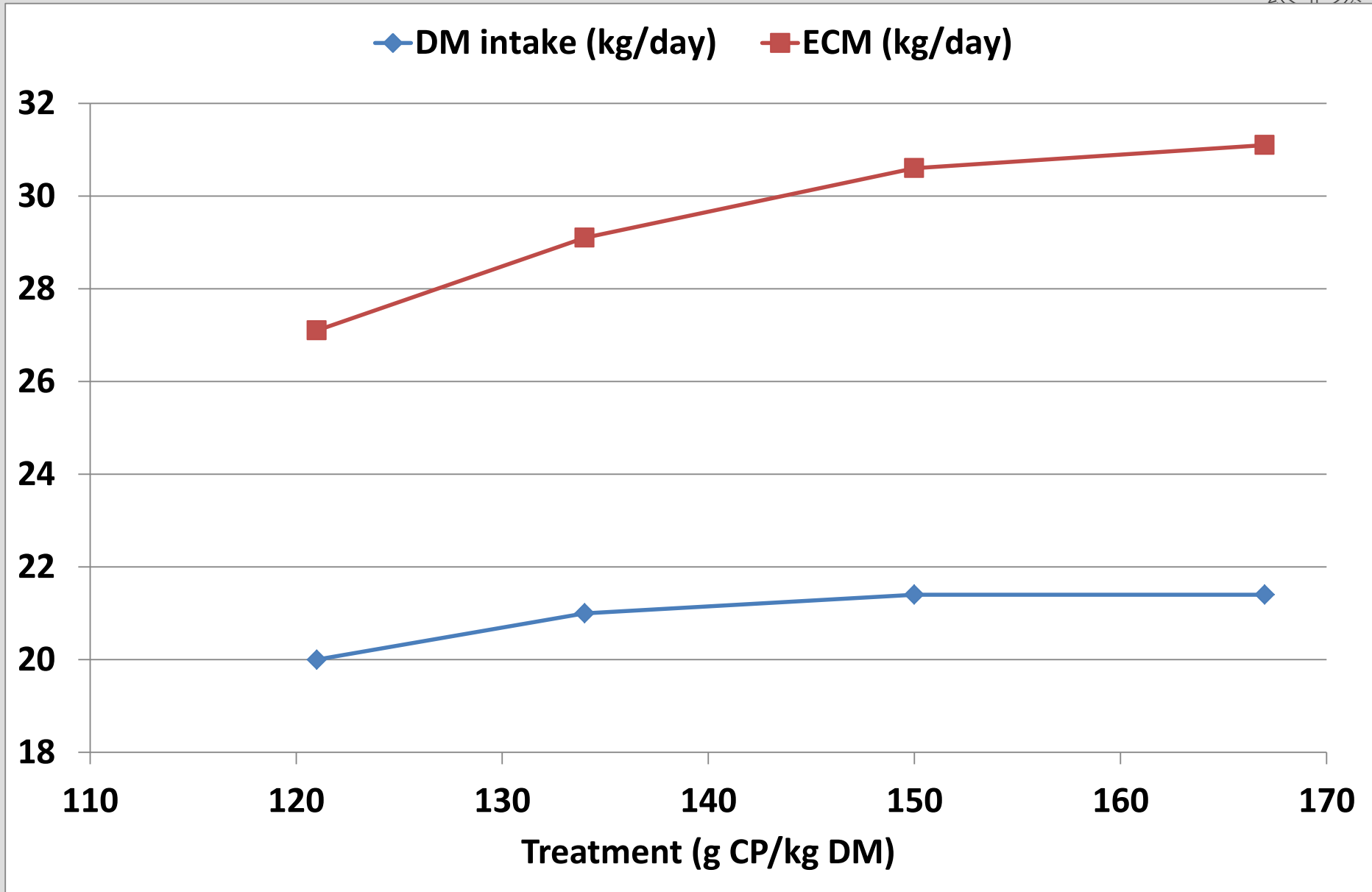
	Treatments (g CP/kg DM)			
	121	134	150	167
Maize silage	300	300	300	300
Grass-clover silage	250	250	250	250
Barley, rolled	298	298	298	298
Soybean meal, dehul.	0	40	80	120
Molasses, cane	24	16	8	0
Soy hulls	96	64	32	0
Min. + vit.	22.5	22.5	22.5	22.5
PFAD fat	10	10	10	10

Treatments

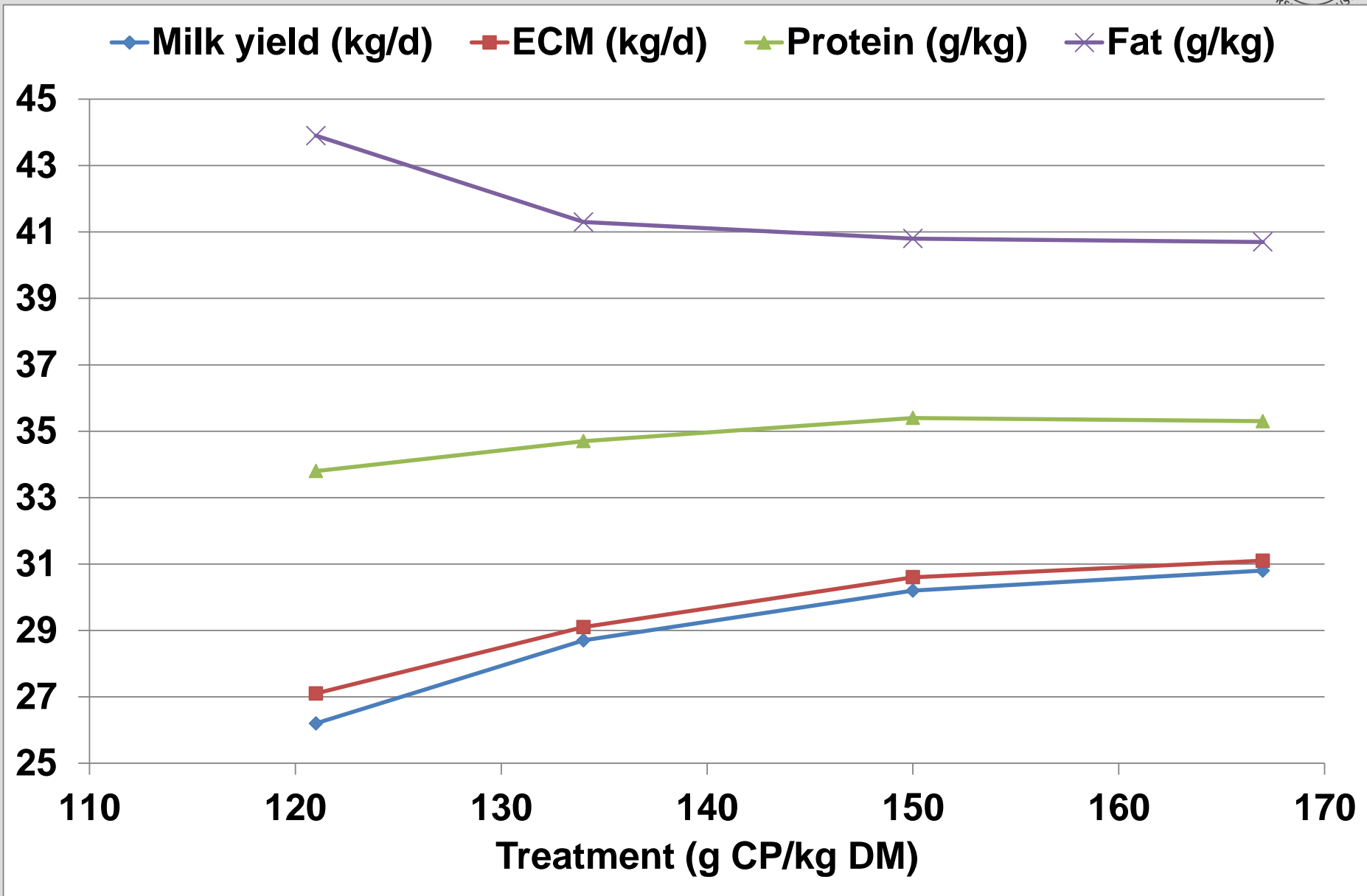


Treatments,	121	134	150	167
g CP/kg DM				
<hr/>				
Rumen deg. CP,	84	94	105	115
g/kg DM				
Protein balance	-8	4	16	28
rumen_{norfor}, g/kg DM				
NEL, MJ/kg DM	6.59	6.71	6.85	6.97

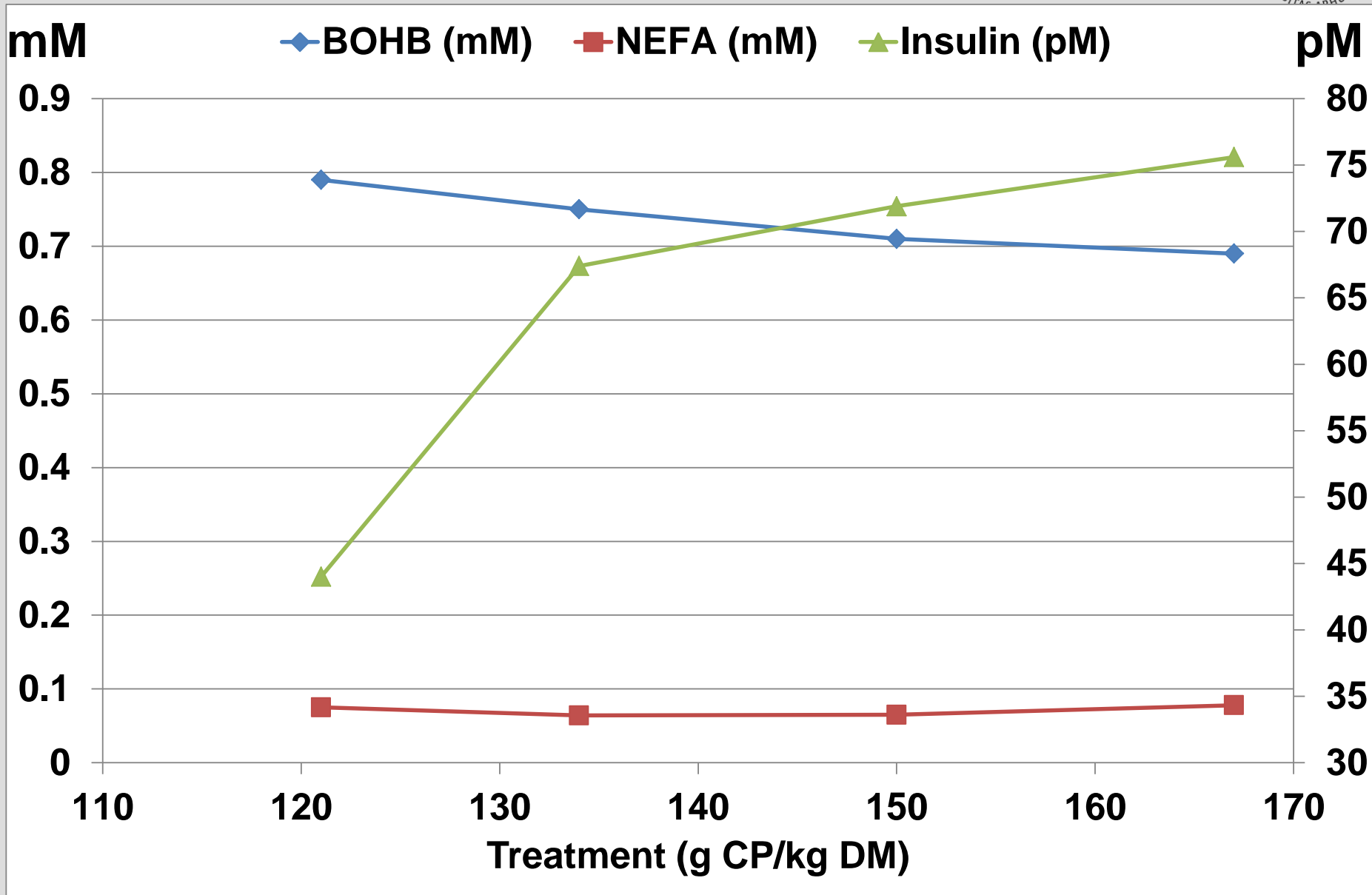
DM intake and milk yield



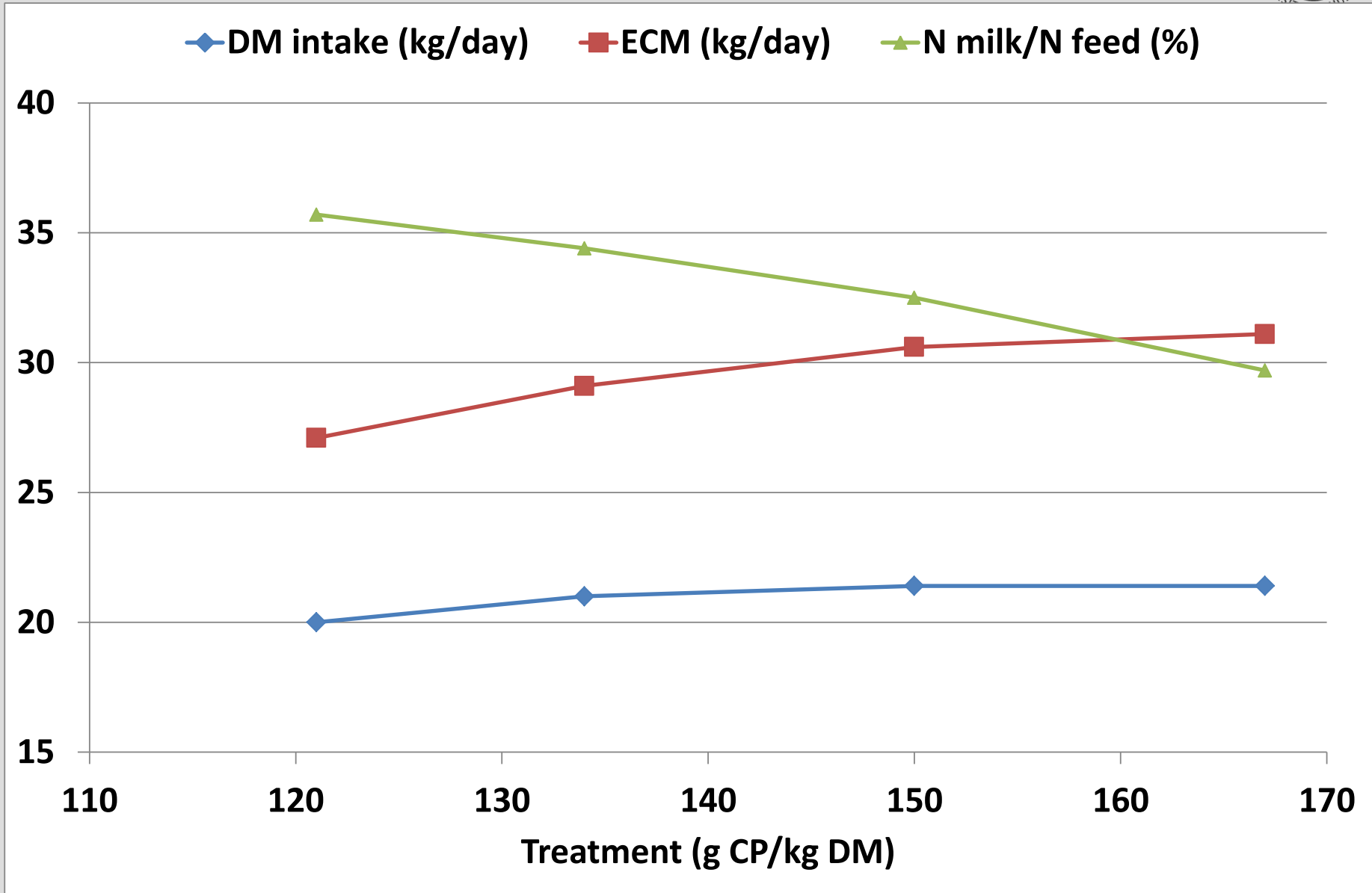
Milk yield and composition



Blood analysis



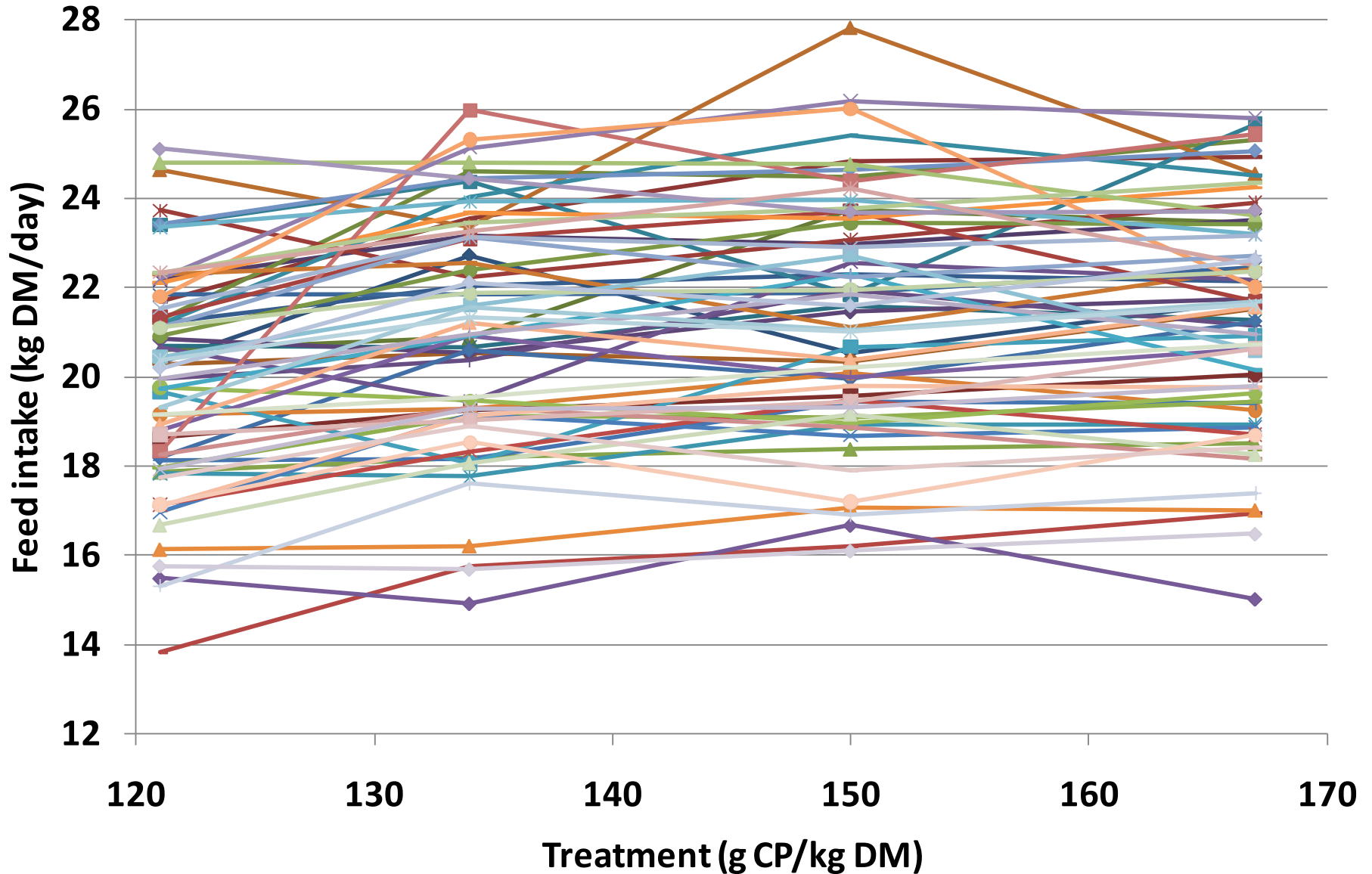
N efficiency



Do different cows respond differently on low protein supply?



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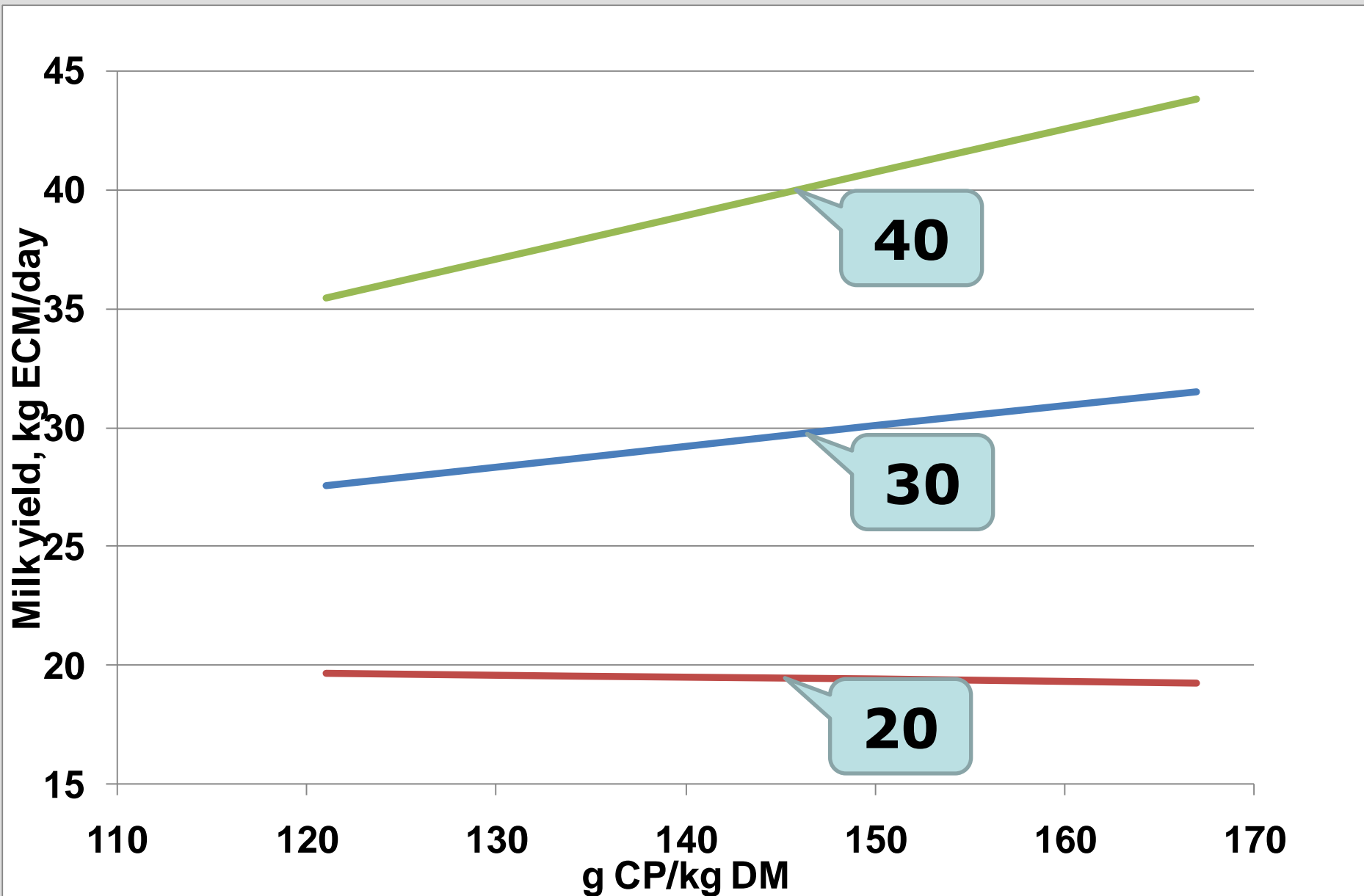
Correlations between level and slope estimated for individual cows response



DM intake	Level	Slope
Level	1	0,09 (0.47)
Slope		1

ECM	Level	Slope
Level	1	0.43 (0.0005)
Slope		1

Response to increased protein level – at different milk yield levels





Conclusions

Responses to protein supply above 15% CP in DM very modest

High yielding cows are more sensitive to low protein supply



Thank you
for your
attention