

Effects of dietary composition on growth performance in Pirarucu (*Arapaima gigas*) and Cachama blanca (*Piaractus brachypomus*) registration number 8978937

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Objectives:

- 1-. To test the hypothesis that there is a protein sparing effect when cachama are fed diets with increasing levels of carbohydrate and lipid energy.
- 2-. To test the hypothesis that pirarucu utilize dietary protein more efficiently with increasing lipid inclusion levels.

Methods:

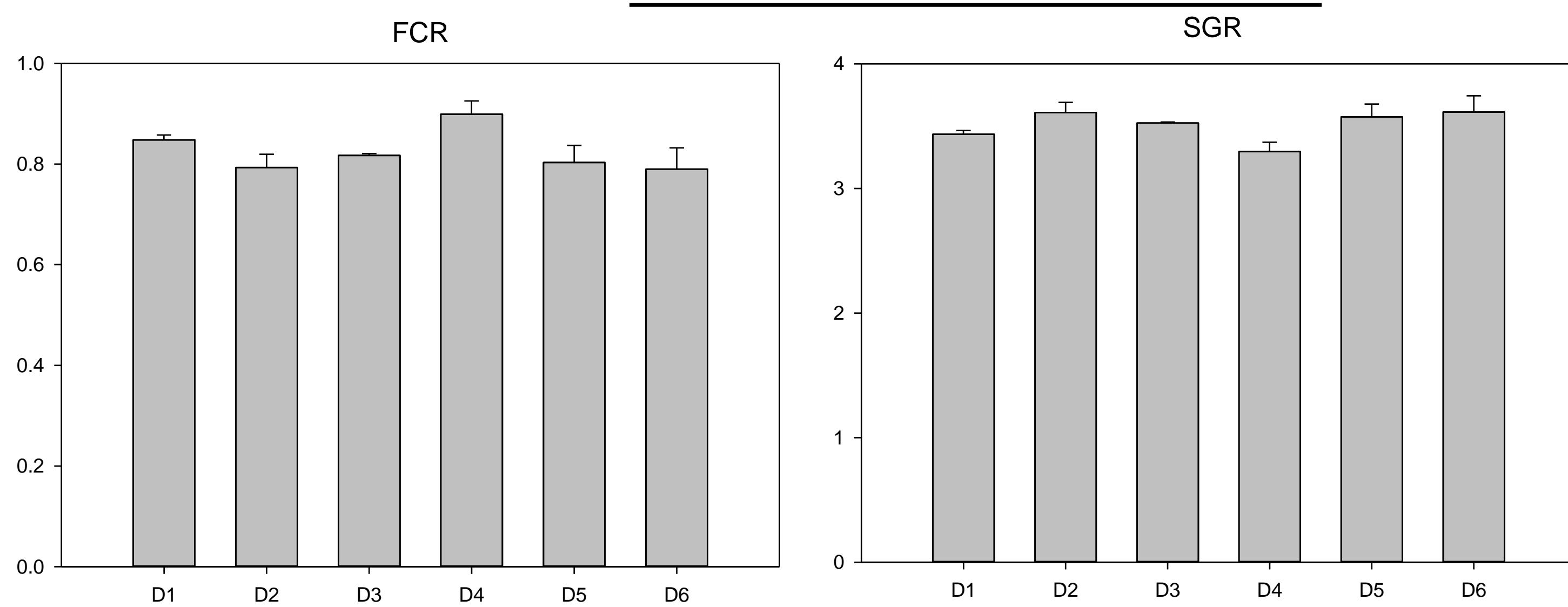
Cachama experiments were conducted in a digestibility setup:
6 practical diets were formulated to contain increasing levels of protein at the expense of lipid and starch as energy sources

- Performance was assessed as.
- Digestibility of nutrients.
- Specific growth rate.
- Feed conversion efficiency.
- Nitrogen excretion.

CACHAMA ANALISYS

	D1	D2	D3	D4	D5	D6
Fishmeal Super Prime	24,2	26,3	28,5	30,7	32,9	35,1
Pea protein concentrate	15,0	15,0	15,0	15,0	15,0	15,0
Wheat gluten	8,0	10,5	13,1	15,4	17,6	19,8
Pea starch	25,1	22,6	20,1	17,7	15,3	12,9
Rapeseed oil	10,5	9,2	7,8	6,6	5,5	4,4
DP:DE	16,5	18,0	19,5	21,0	22,5	23,9

Growth and feed conversion:



Conclusions: Cachama:

- DP/DE does not affect nutrient digestibility
- DP/DE does not affect FCR or SGR
- When DP/DE increases to more than 19.5-gram protein per MJ energy, fish are not able to efficiently convert protein to growth.
- Instead, dietary nitrogen is delaminated and excreted to the environment.



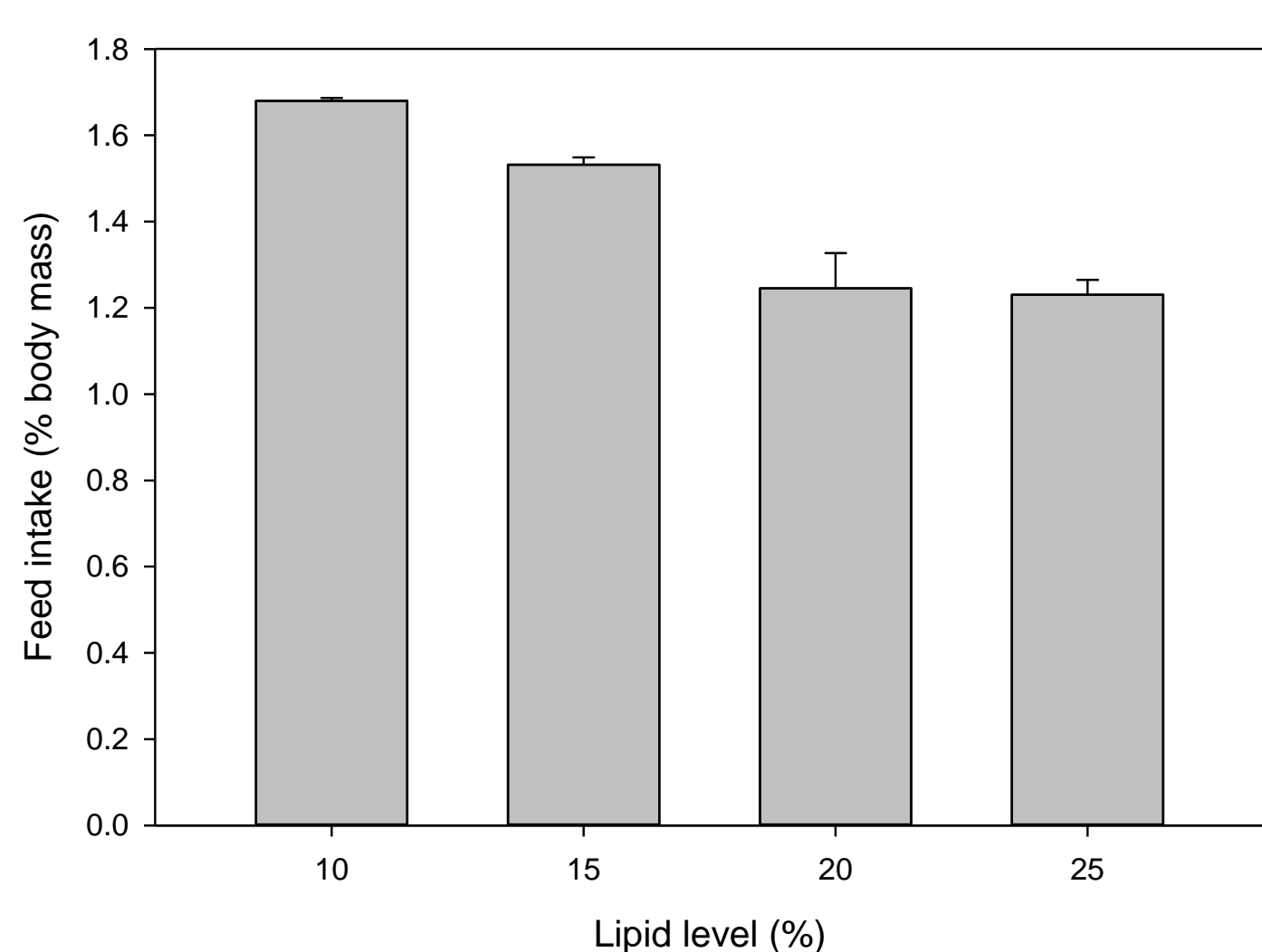
PIRARUCU ANALISYS

Diet	10	15	20	25
Crude protein (g/100g)	49.8	47.0	44.2	41.5
Crude lipid (g/100g)	10.0	14.8	19.5	24.2
Crude carbohydrate (g/100g)	12.6	11.9	11.2	10.5
Protein energy (MJ/kg diet)	12.4	11.8	11.1	10.5
Lipid energy (MJ/kg diet)	4.1	6.0	7.8	9.7
Carbohydrate energy (MJ/kg diet)	2.3	2.2	2.0	1.9
Crude energy	18.8	19.9	21.0	22.1
DP:DE	26.5	23.6	21.1	18.8

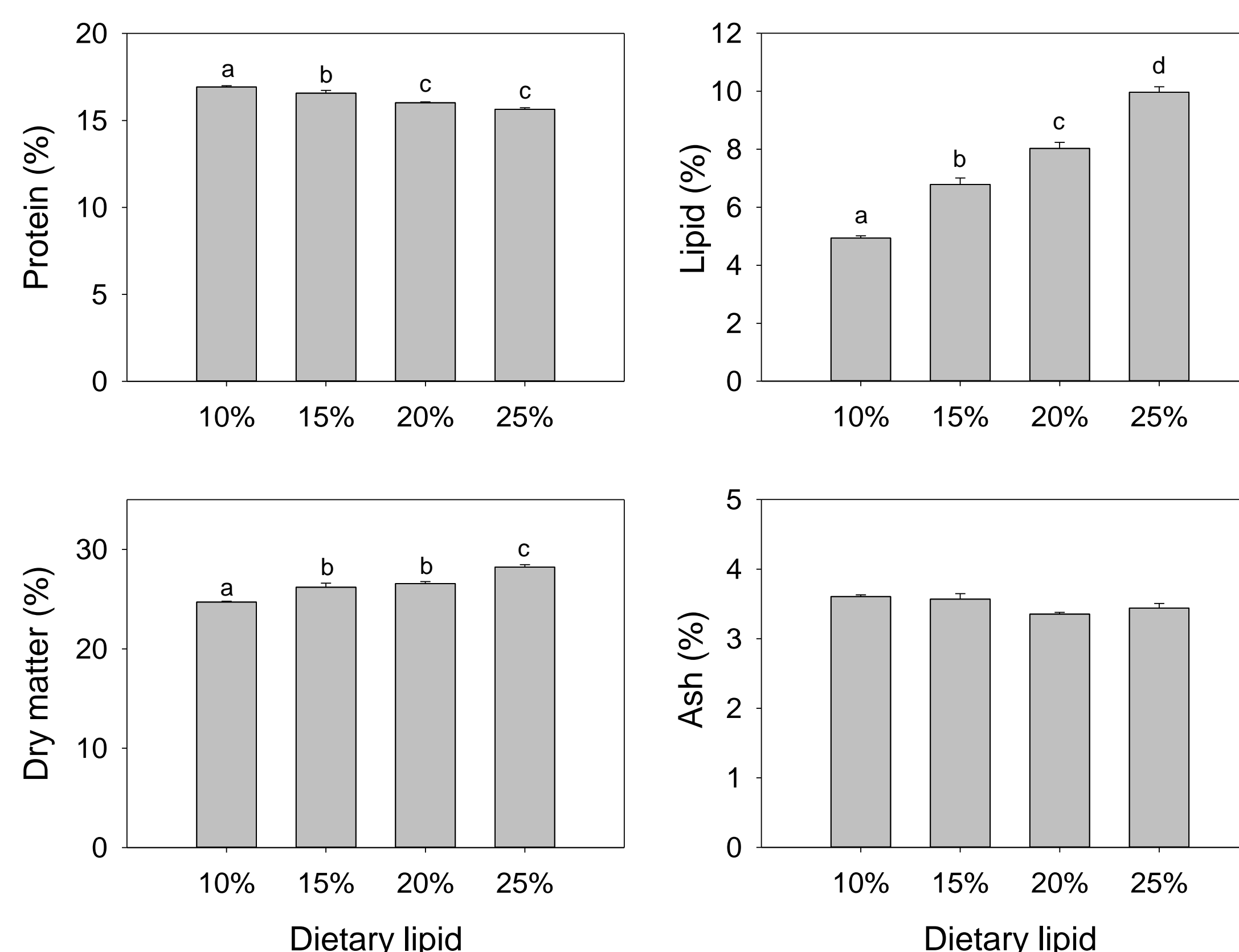
Methods:

Experiments were conducted in a tank based setup
4 practical diets were formulated to contain increasing levels of lipid at the expense of protein
Performance was assessed as
a.Feed intake
b.Specific growth rate
c.Feed conversion efficiency
d.Carcass composition.

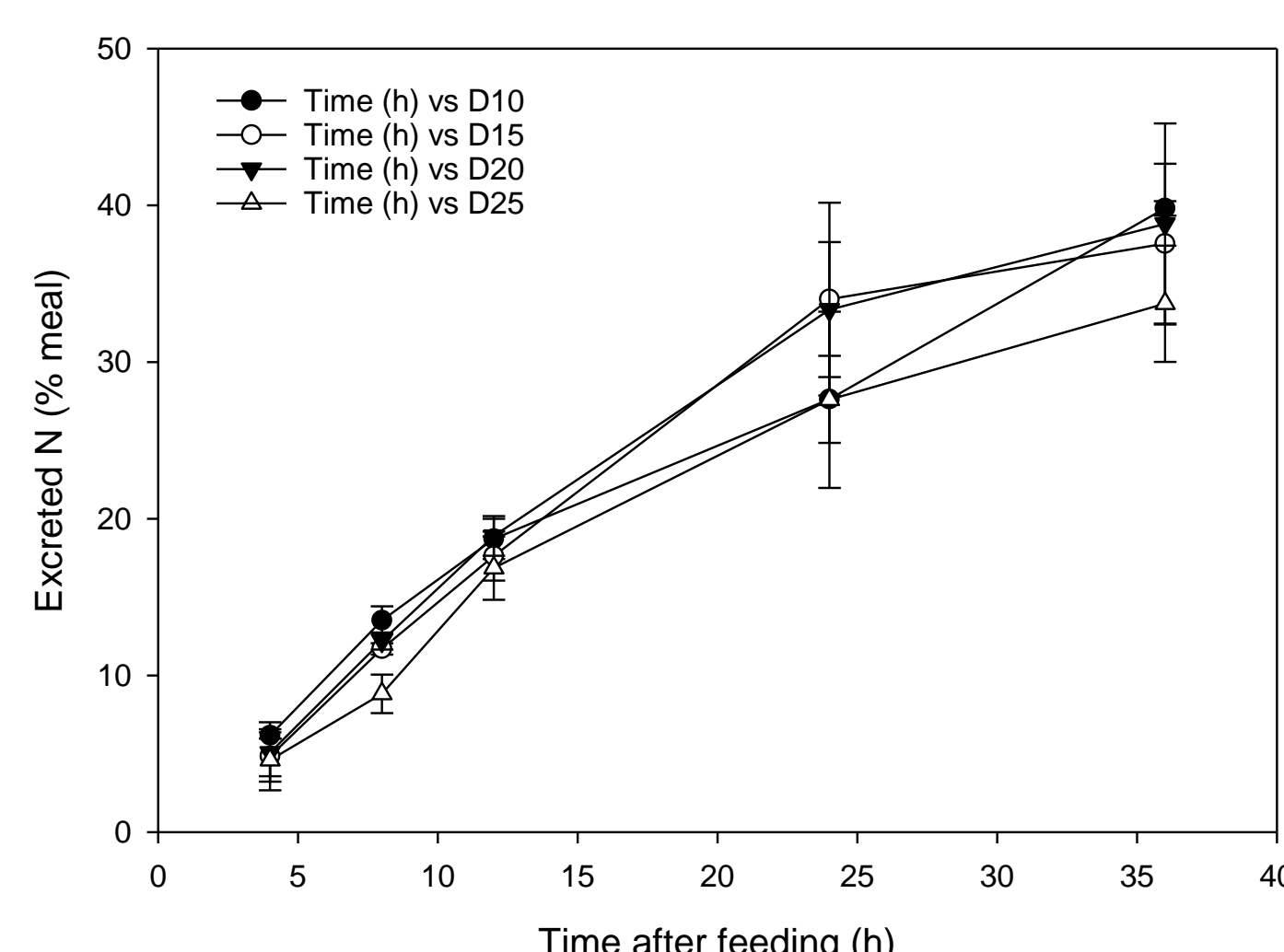
Feed intake



Carcass composition



Nitrogen excretion



Conclusions Pirarucu:

- Increasing dietary lipid does not appear to spare protein.
- High lipid levels lead to appetite satiation and cause reduced feed intake.
- High lipid levels lead to a change in carcass composition, most pronounced by a doubling in tissue fat.

