

CONTENT OF FATTY ACIDS, VITAMIN E AND CAROTENOIDS IN MILK AND HERBAGE AS AFFECTED BY SWARD COMPOSITION AND PERIOD OF GRAZING

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BACKGROUND

- › Organic milk has a higher content of
 - › Polyunsaturated fatty acids (C18:3 n3, CLA)
 - › Carotenoids
 - › Tocopherols
- › These qualities are related to
 - › Grass based feeding
 - › Legumes and herbs in grass swards

EXPERIMENTAL SETUP

- › Swards based on ryegrass and following plant species
- › White clover
- › Red clover
- › Lucerne
- › Chicory (and white clover)
- › 3 grazing periods: May, June, August
- › 4 groups of 12 Holstein cows

ANALYSES

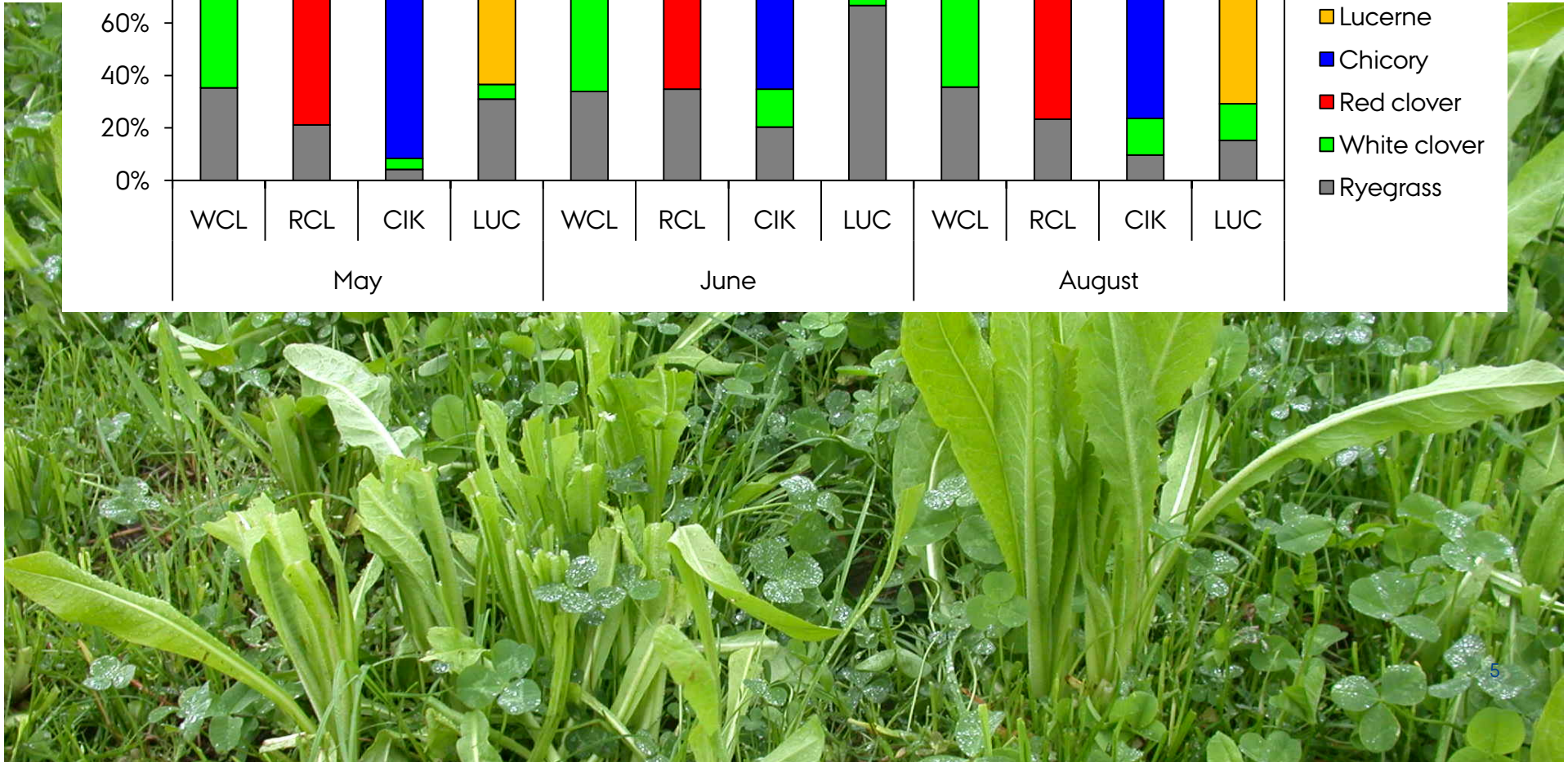
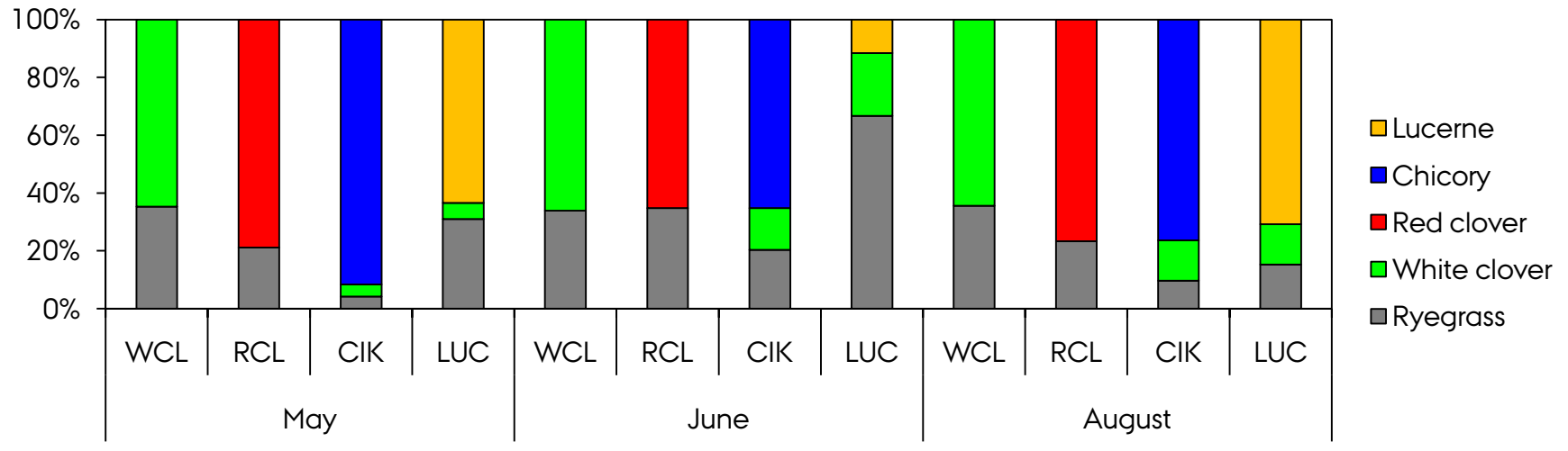
> Herbage:

- > Botanical composition
- > Feed quality (NIR)
- > Fatty acids
- > Carotenoids
- > Tocopherols

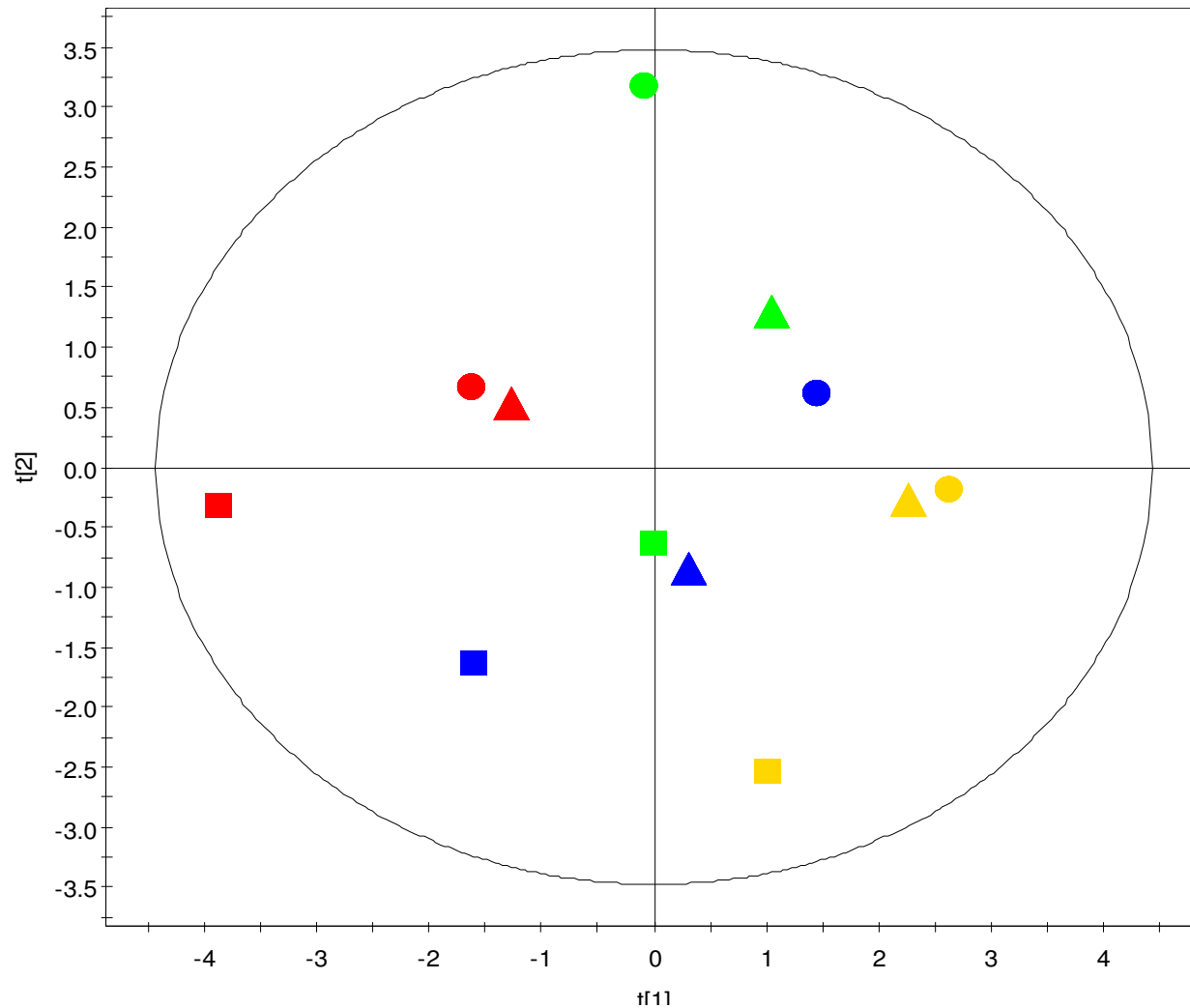
> Milk:

- > Yield
- > Fat, protein
- > Fatty acids
- > Carotenoids
- > Tocopherols

BOTANICAL COMPOSITION OF HERBAGE



PCA HERBAGE COMPOSITION



Chicory

Red clover

White clover

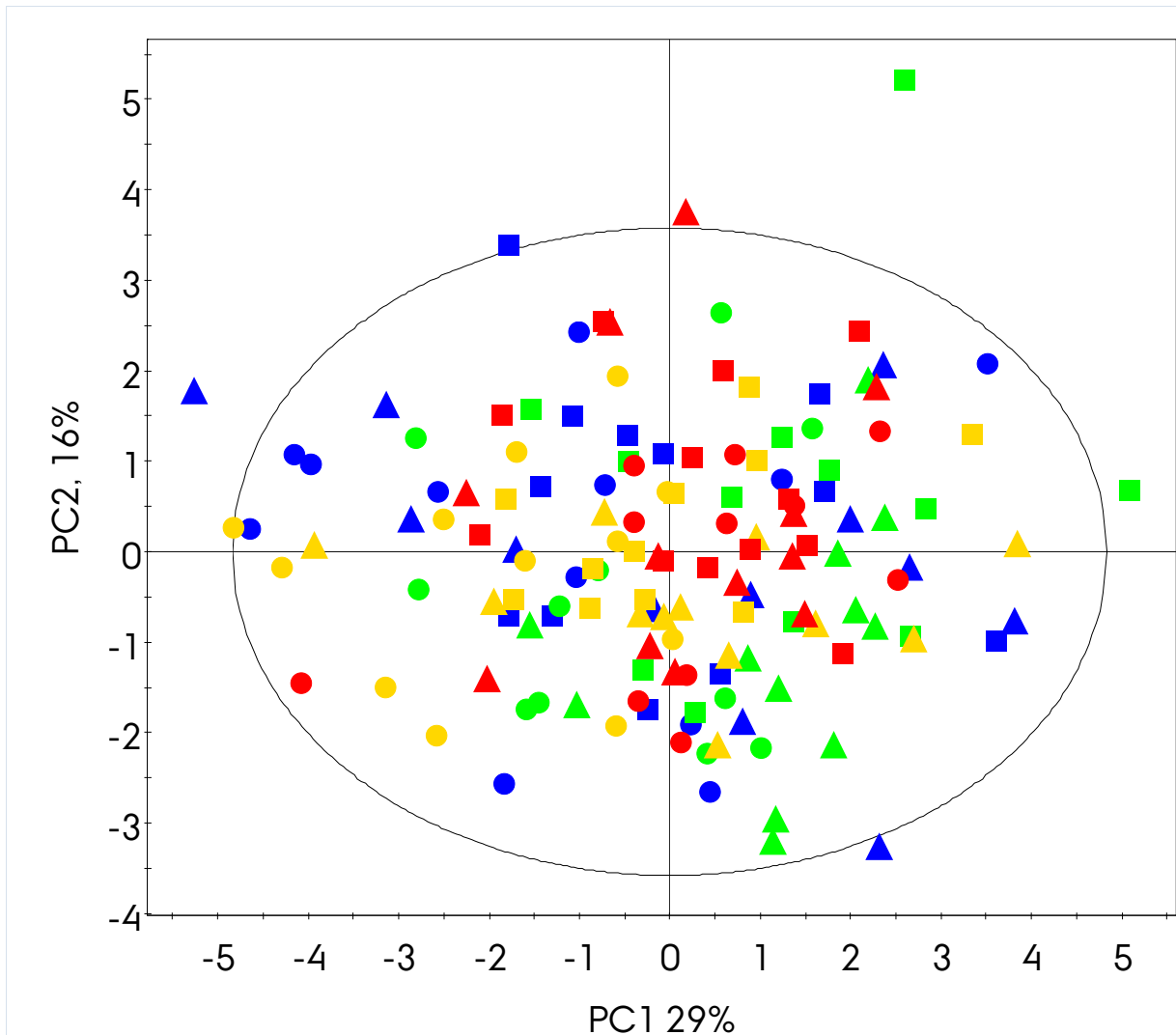
Lucerne

■: May

▲: June

●: August

PCA MILK COMPOSITION



Chicory

Red clover

White clover

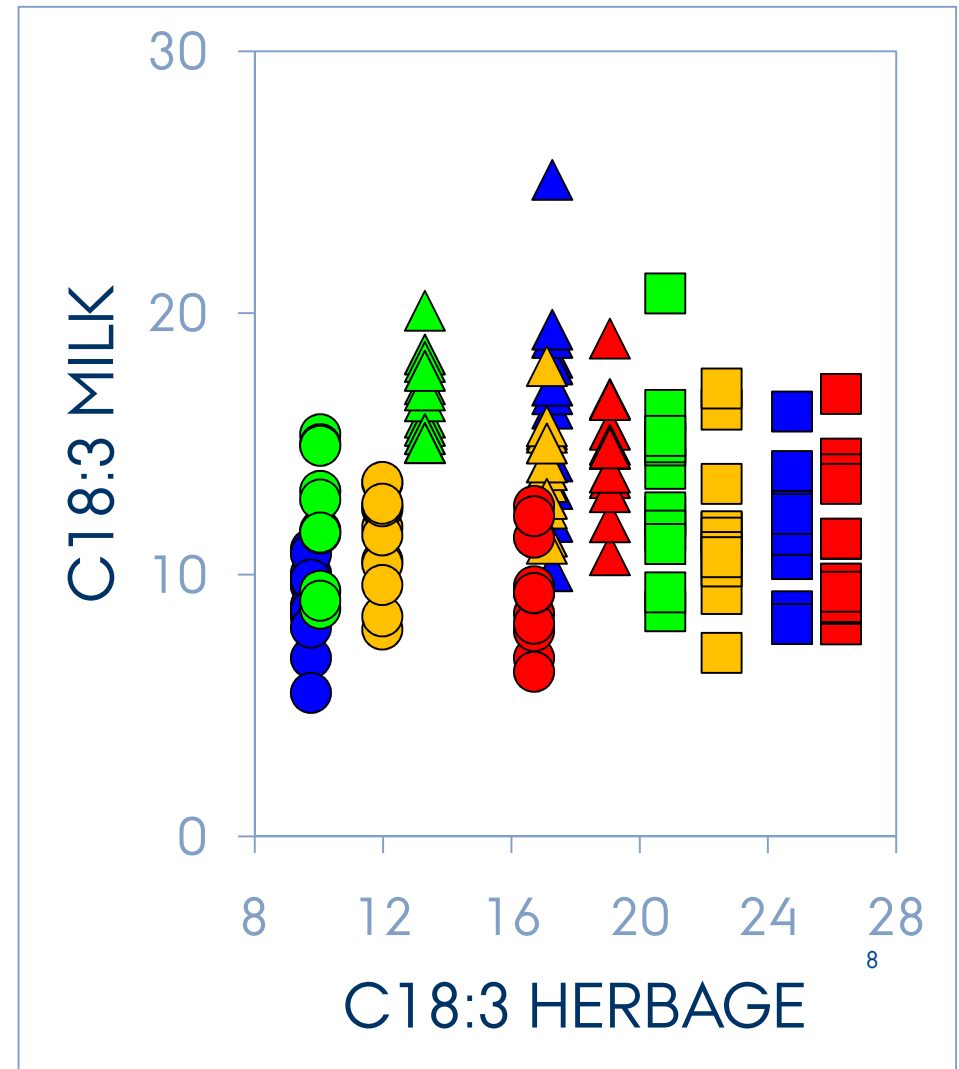
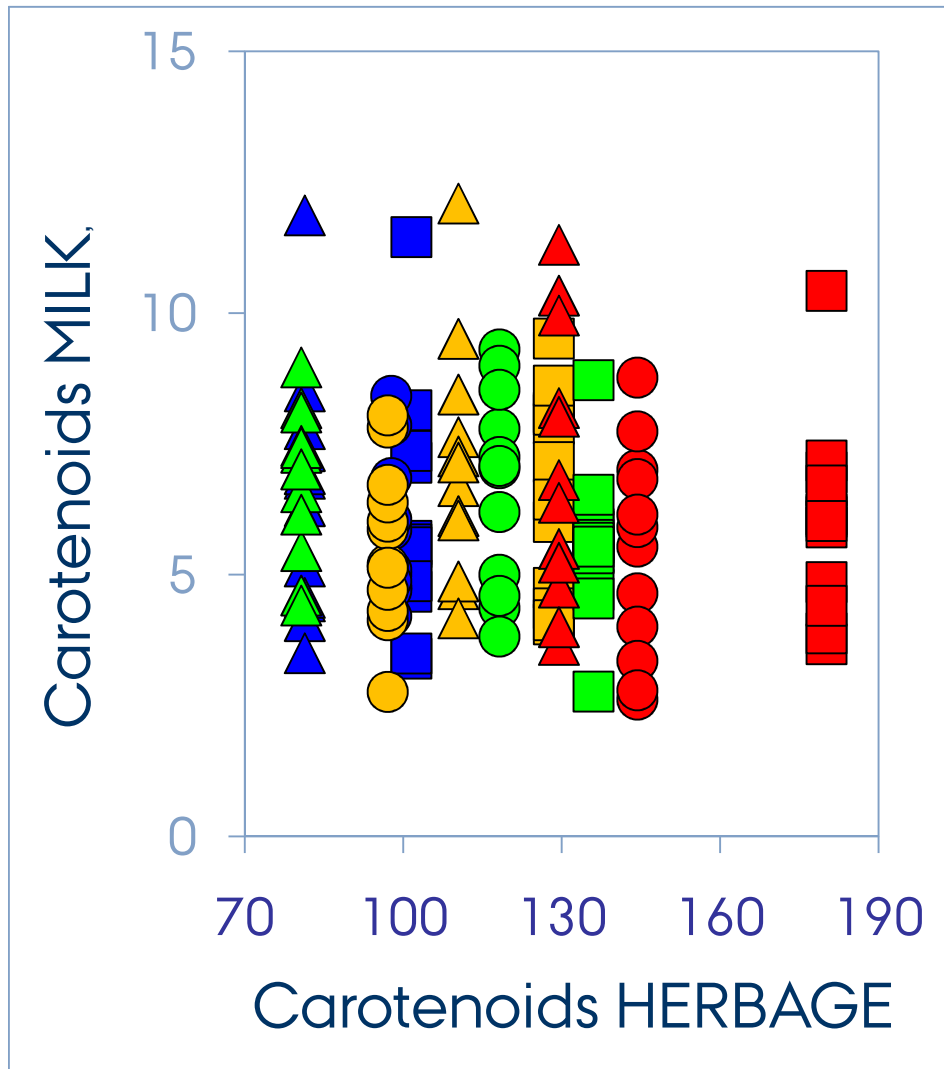
Lucerne

■: May

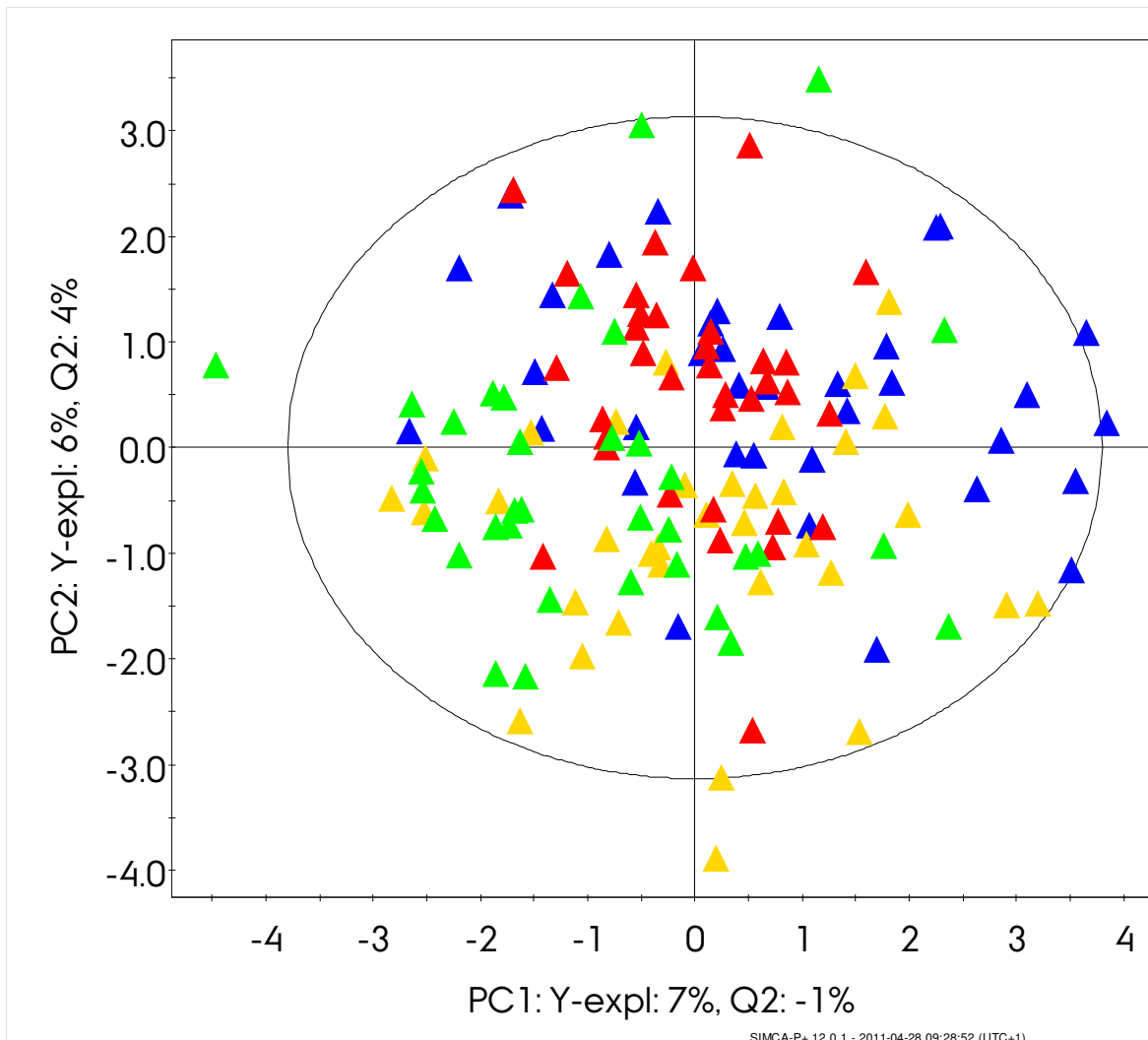
▲: June

●: August

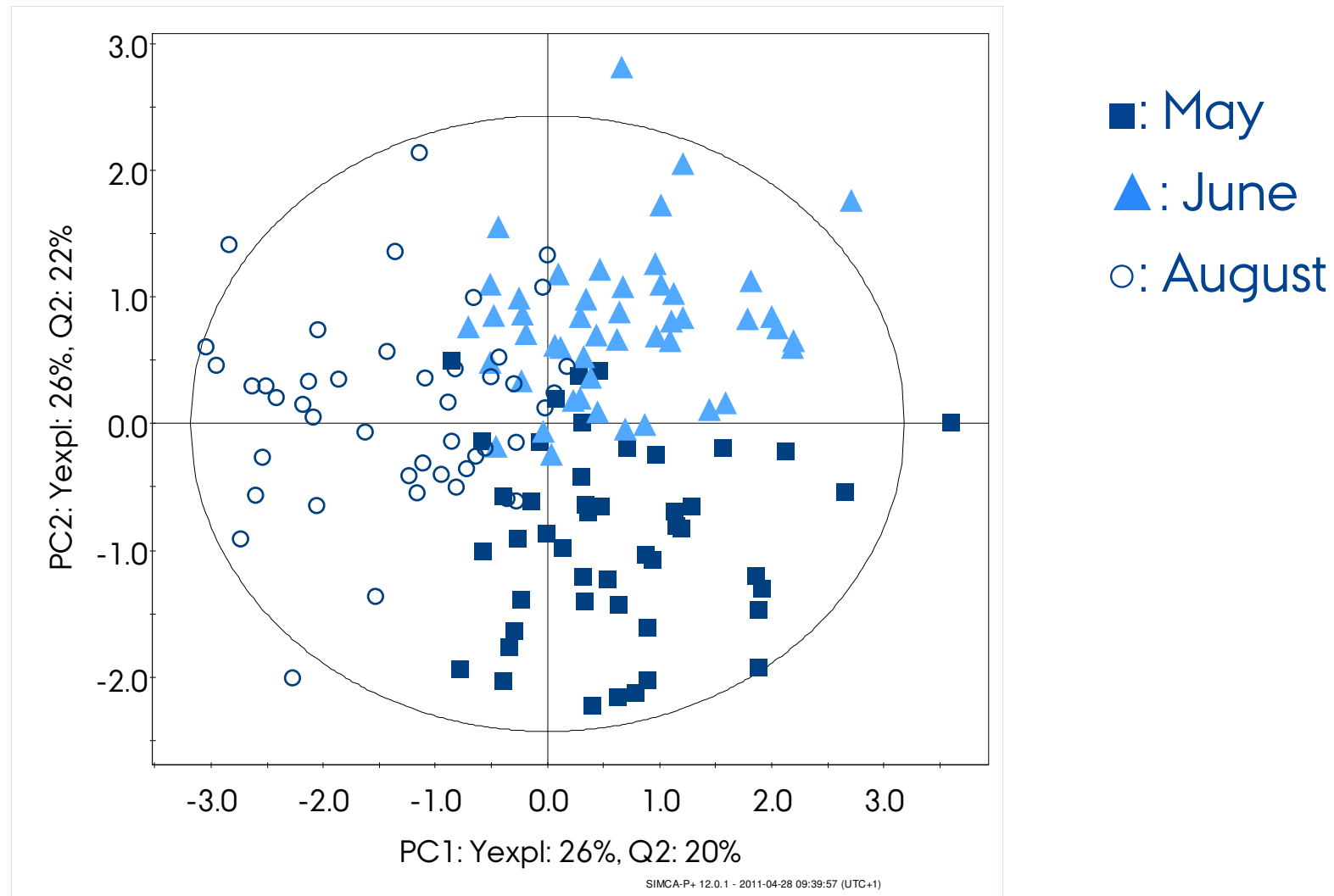
COMPOSITION OF HERBAGE VS. MILK



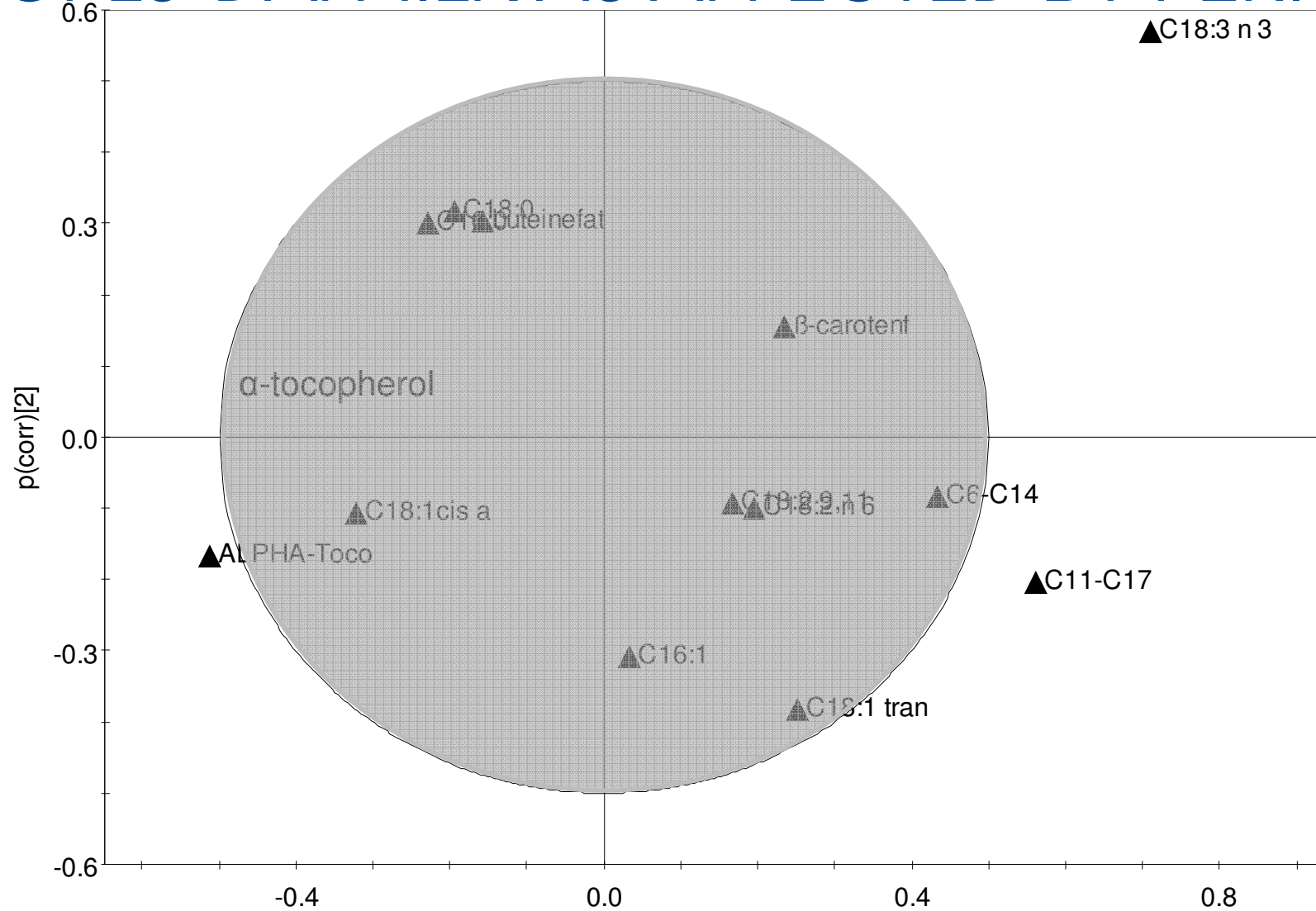
OPLS-DA: MILK AS AFFECTED BY HERBAGE



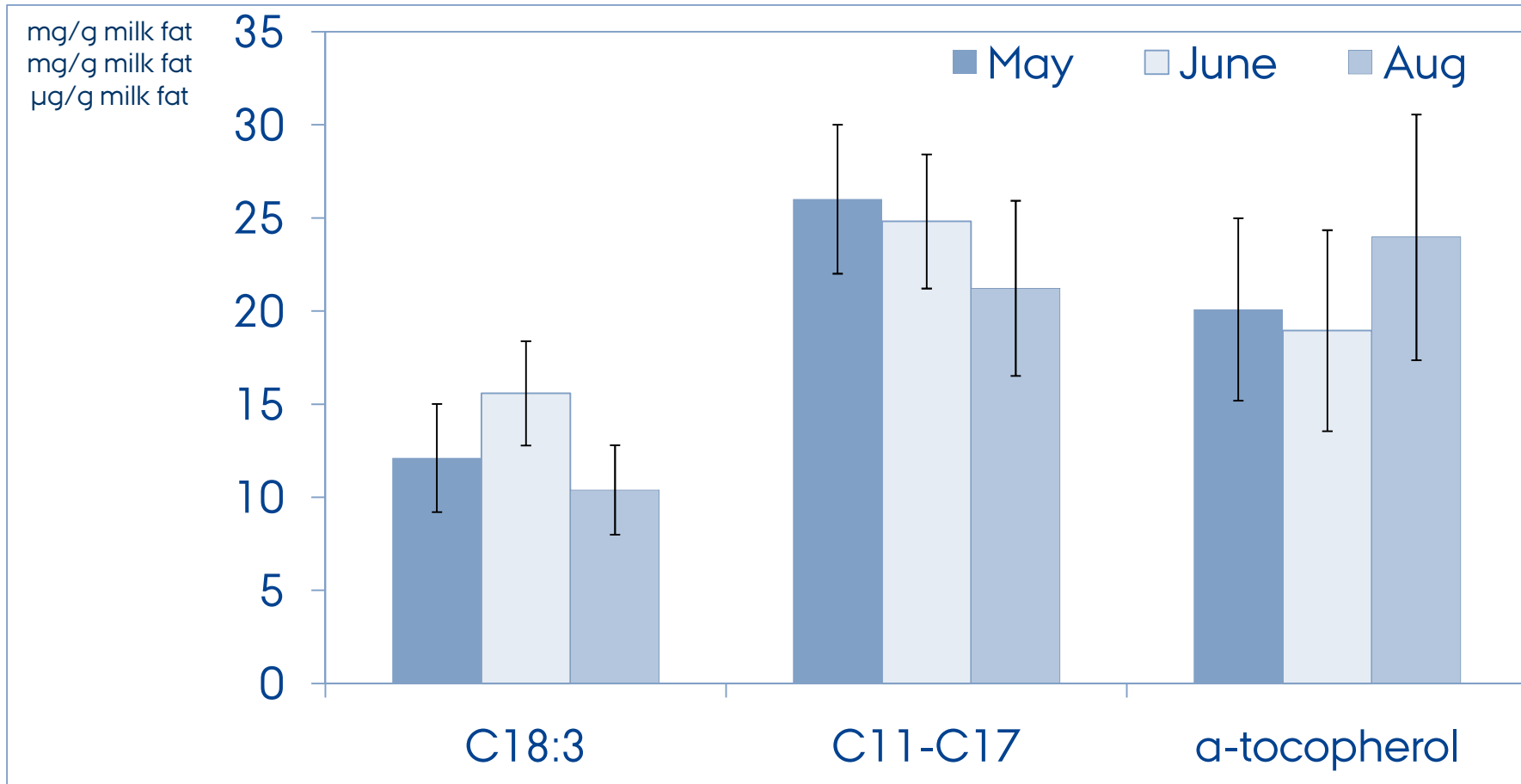
OPLS-DA: MILK AS AFFECTED BY PERIOD



OPLS-DA: MILK AS AFFECTED BY PERIOD



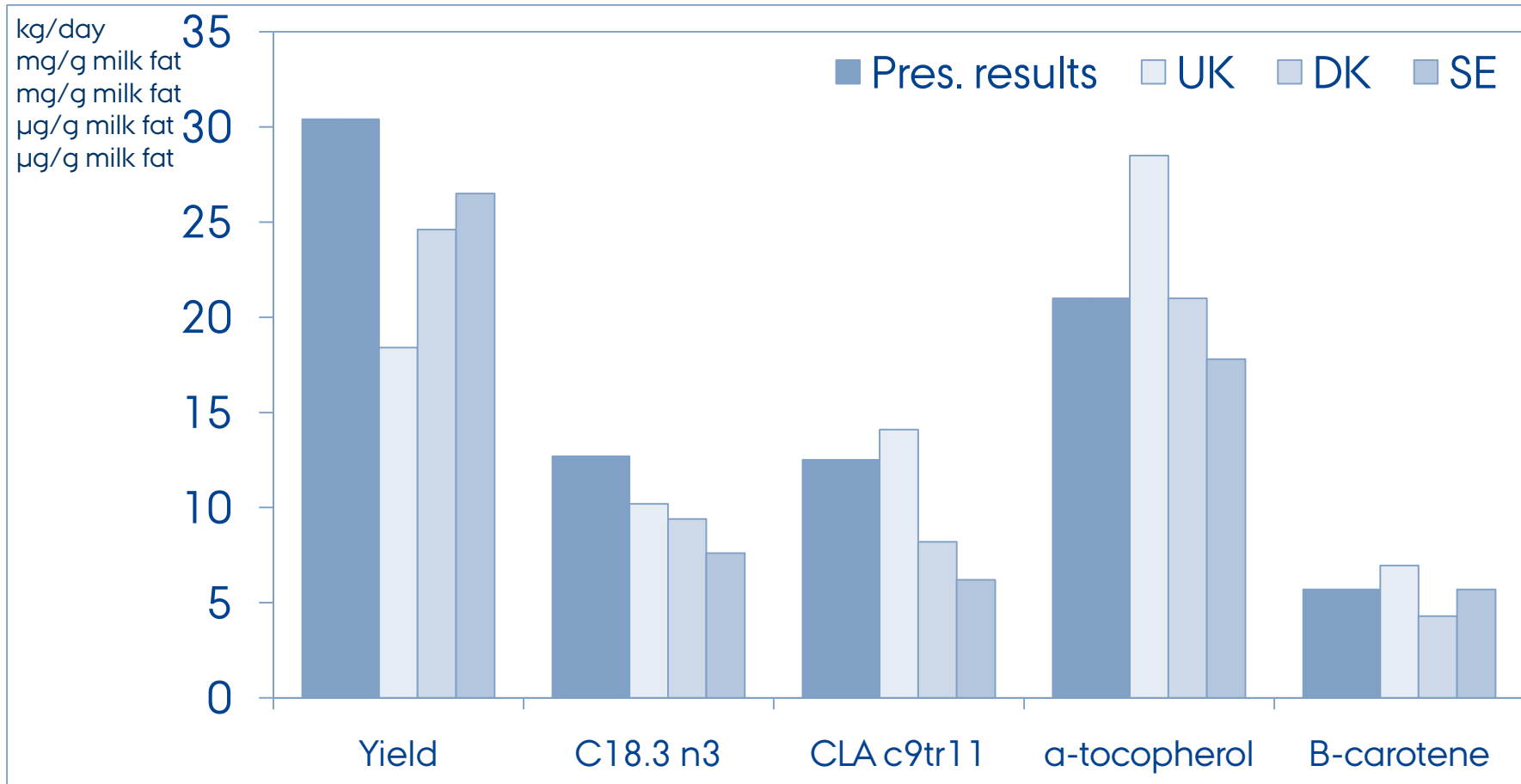
OPLS-DA: MILK AS AFFECTED BY PERIOD



QUALITY LOW INPUT FOOD

- › Survey of dairy farms of different production systems in 3 countries:
- › Comparison of organic and conventional milk
- › **UK:** Increased CLA (+60%), ALA (+39%), antioxidants (+33%)
- › **DK:** Increased CLA (+20%), ALA (+100%), antioxidants (+15%)
- › **SE:** Increased ALA (+43%), antioxidants ($\approx 0\%$), CLA (-20%)

QLIF COMPARISON



CONCLUSIONS

- › All four species were suitable for production of a high yield of milk with high concentrations of PUFA, carotenoids and tocopherols
- › Different periods and species gave only minor differences in milk composition
- › Management of pastures may be a challenge for some species

THANK YOU

