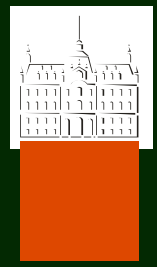
Comparison of milk fatty acid composition between different production systems and seasons



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Session 29: Ruminant nutrition. Free communications

Introduction

- Milk and milk products → basic foods in human nutrition

- Milk fat → physiological and environmental factors → **nutrition**
- Milk fat → appearance, texture, flavour, satiability of milk and milk products

Introduction

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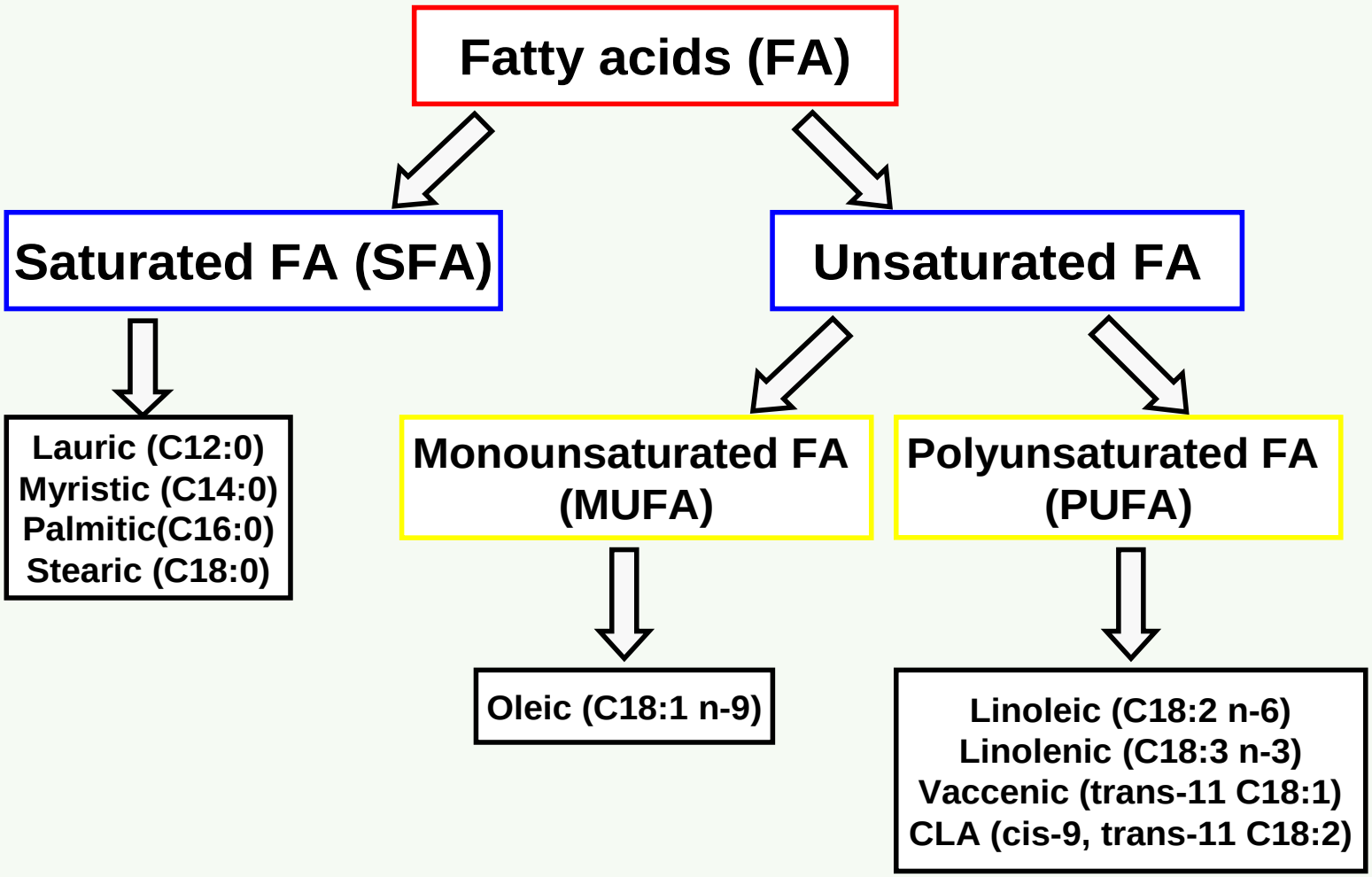

The aim

- Determine differences in FA composition of bulk milk between **organic** and **conventional** production system and investigate the seasonal effects (**summer**, **winter**) on milk FA composition

Materials and methods

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47 bulk milk samples

20 organic

27 conventional

Summer and winter season

Materials and methods

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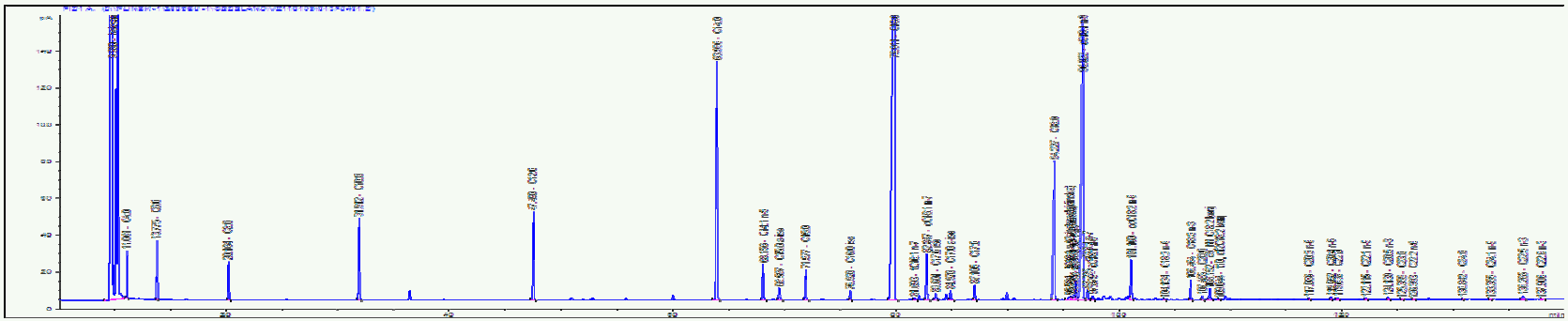

- **Determination of FA composition of milk**
  - Fatty acid methyl esters
  - GC-FID

- **Statistical analysis**
  - General Linear Models (GLM)
  - Tuckey's multiple comparison test

Results

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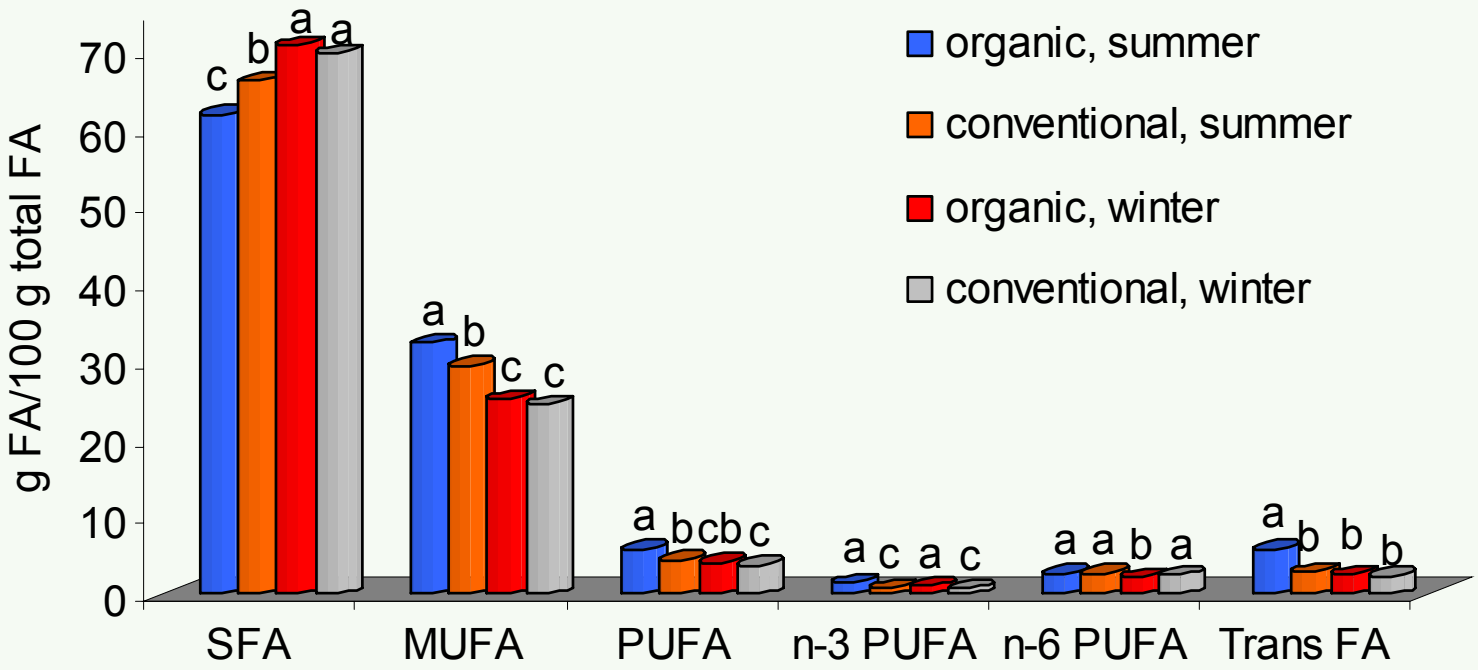
FA composition (g FA/ 100 g total FA) of milk produced in two production systems (organic, conventional) and two seasons (winter, summer)



abc LS-means (least square means) without the same superscript differ significantly, P<0.05

Results

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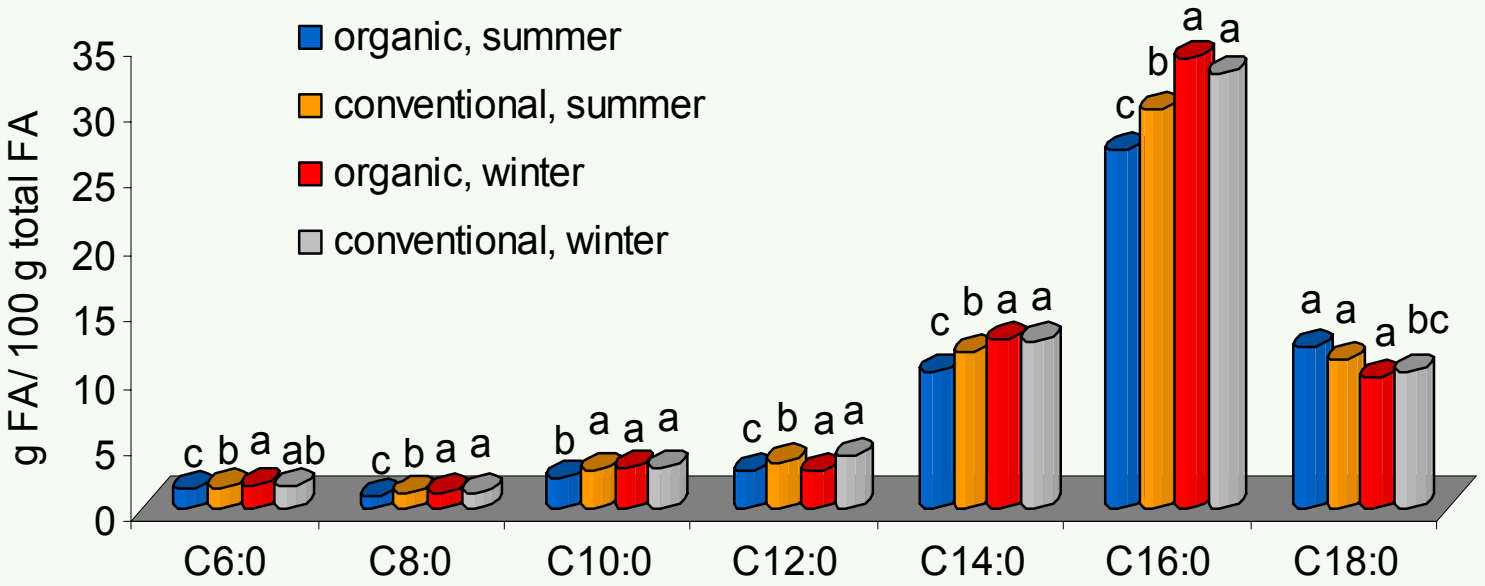
Proportions of Individual SFA (g FA/ 100 g total FA) in milk produced in two production systems (organic, conventional) and two seasons (winter, summer)



abc LS-means (least square means) without the same superscript differ significantly, P<0.05

Results

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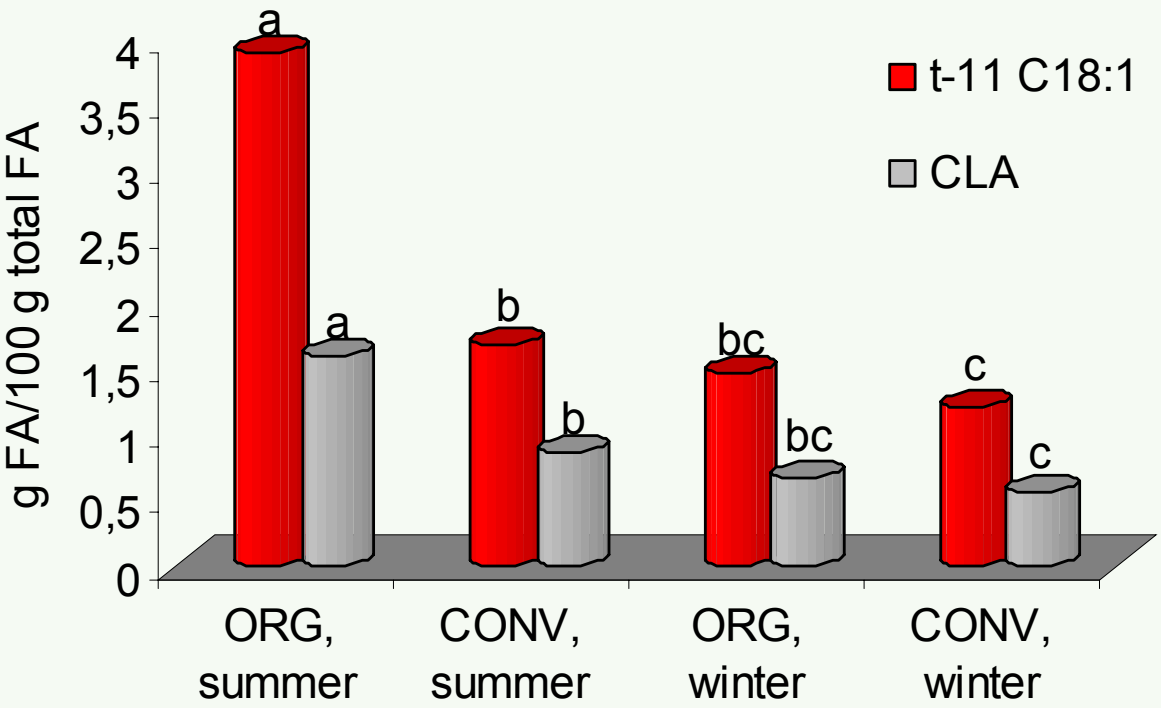
Proportions of CLA and vaccenic acid (g FA/ 100 g total FA) in milk produced in two production systems (organic, conventional) and two seasons (winter, summer)



abc LS-means (least square means) without the same superscript differ significantly, P<0.05

Results

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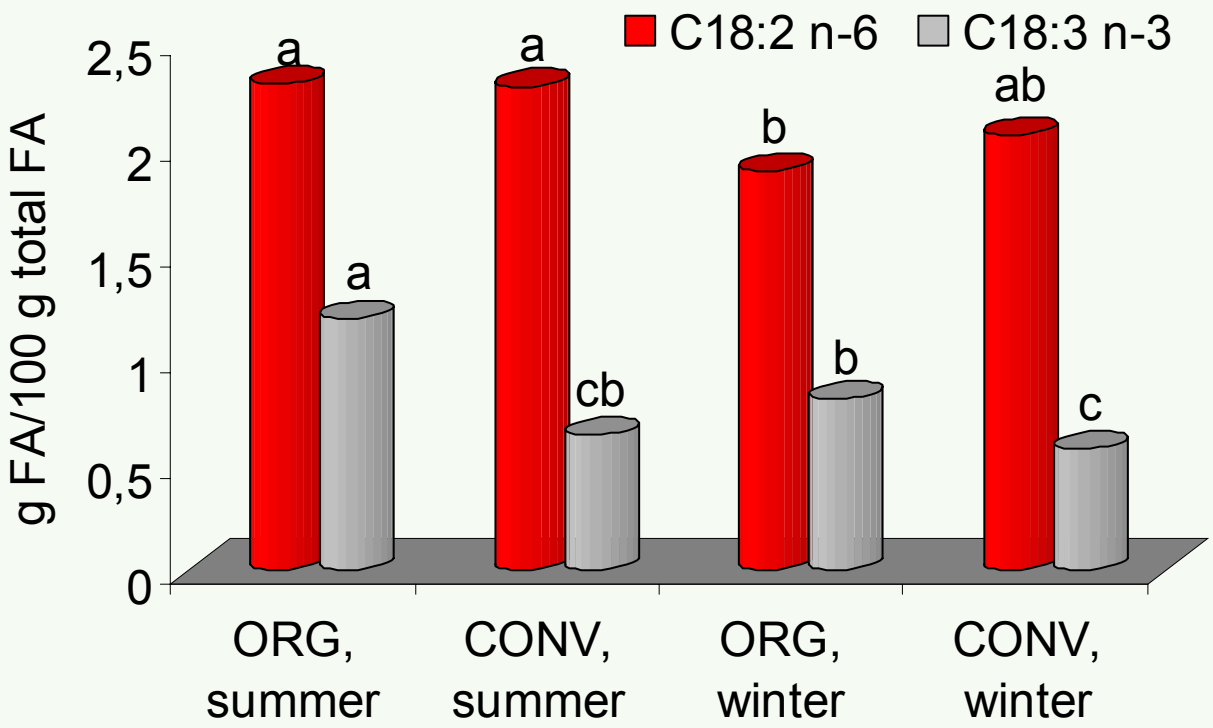
Proportions of linoleic and linolenic acid (g FA/ 100 g total FA) in milk produced in two production systems (organic, conventional) and two seasons (winter, summer)



abc LS-means (least square means) without the same superscript differ significantly, P<0.05

Results

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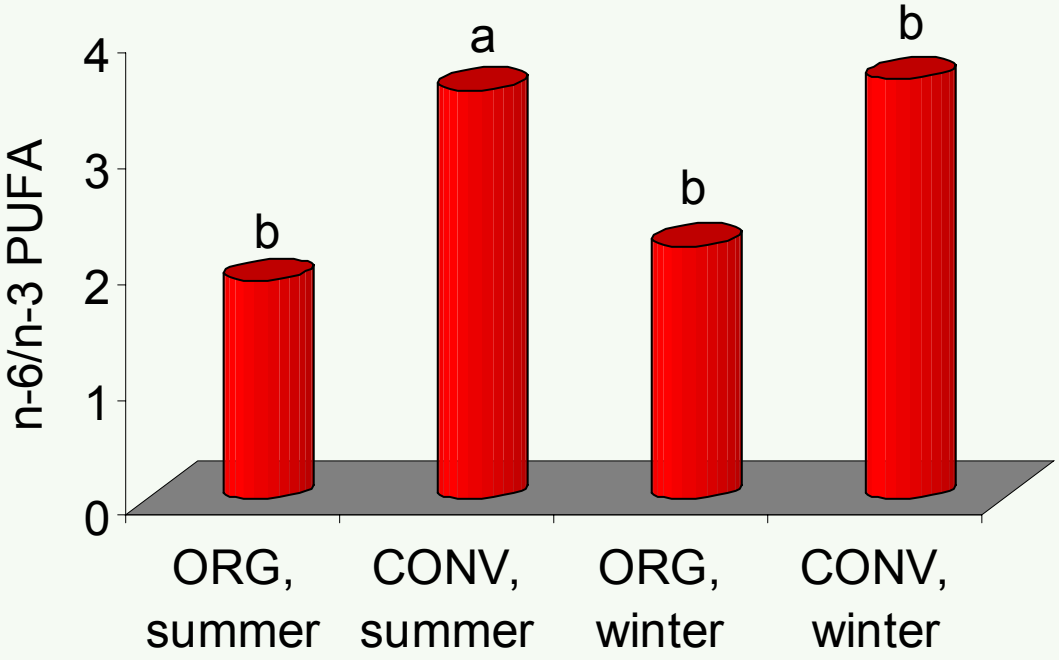
n-6/n-3 PUFA ratio in milk produced in two production systems (organic, conventional) and two seasons (winter, summer)



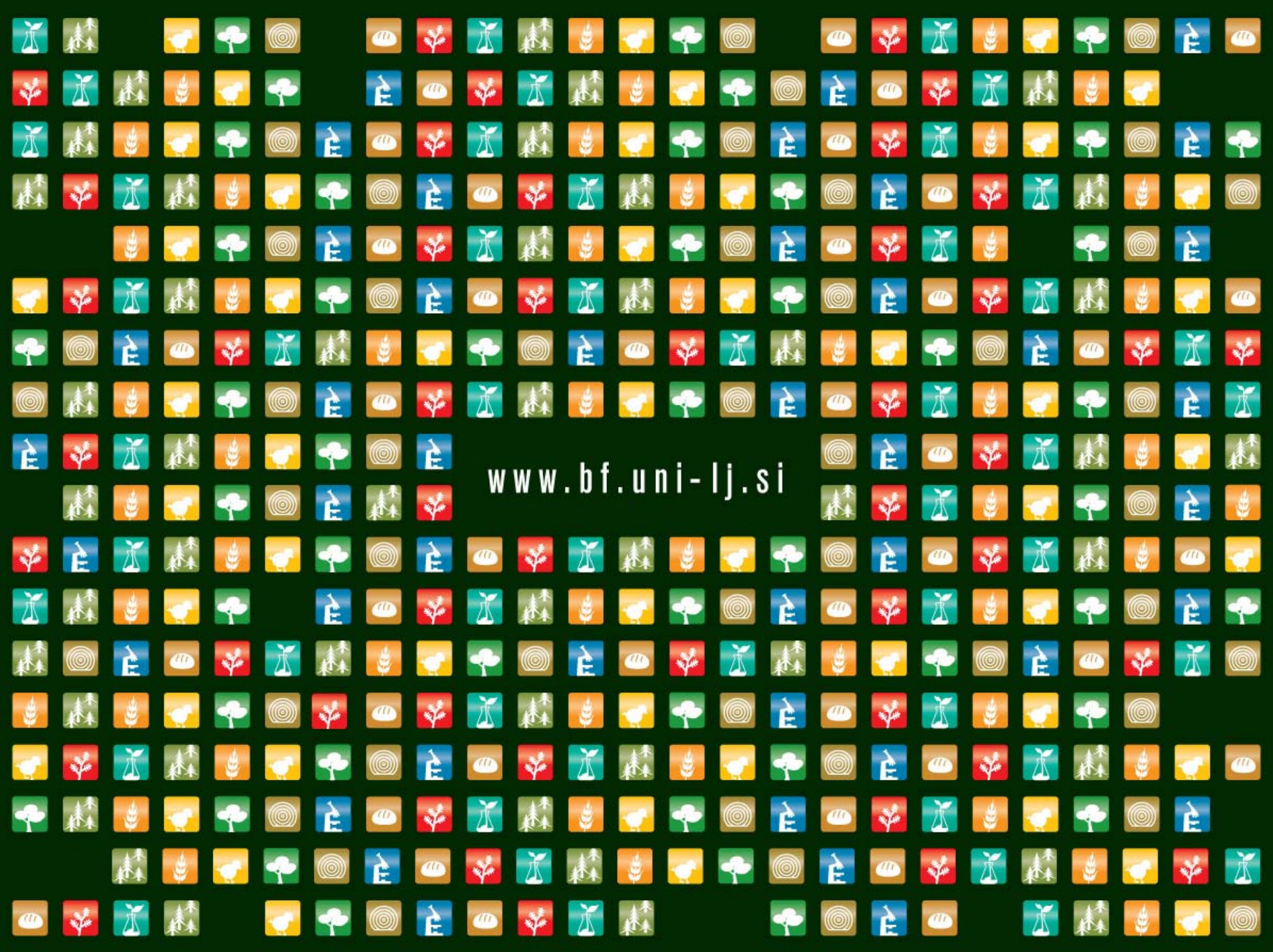
abc LS-means (least square means) without the same superscript differ significantly, P<0.05

Conclusion

- Milk produced in organic production system contained lower proportions of SFA than conventionally produced milk.
- Excessive consumption of SFA may have unbeneficial health effects on human therefore we can say that organically produced milk is more recommendable.
- Milk produced on organic farms had decreased n-6/n-3 PUFA ratio in comparison to conventional milk due to higher n-3 PUFA concentration.

Conclusion

- Significant differences in FA composition was found in milk regarding two seasons.
- Milk produced in summer contained lower proportions of SFA and higher proportions of MUFA and PUFA.
- The concentrations of CLA, vaccenic acid and n-3 PUFA were higher in milk produced in summer season in comparison to winter.
- Milk produced from organic reared cows especially in summer season contained higher amounts of health promoting FA.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