Dried Distillers Grain byproduct improves the fatty acid profile of ewe milk in Chios sheep

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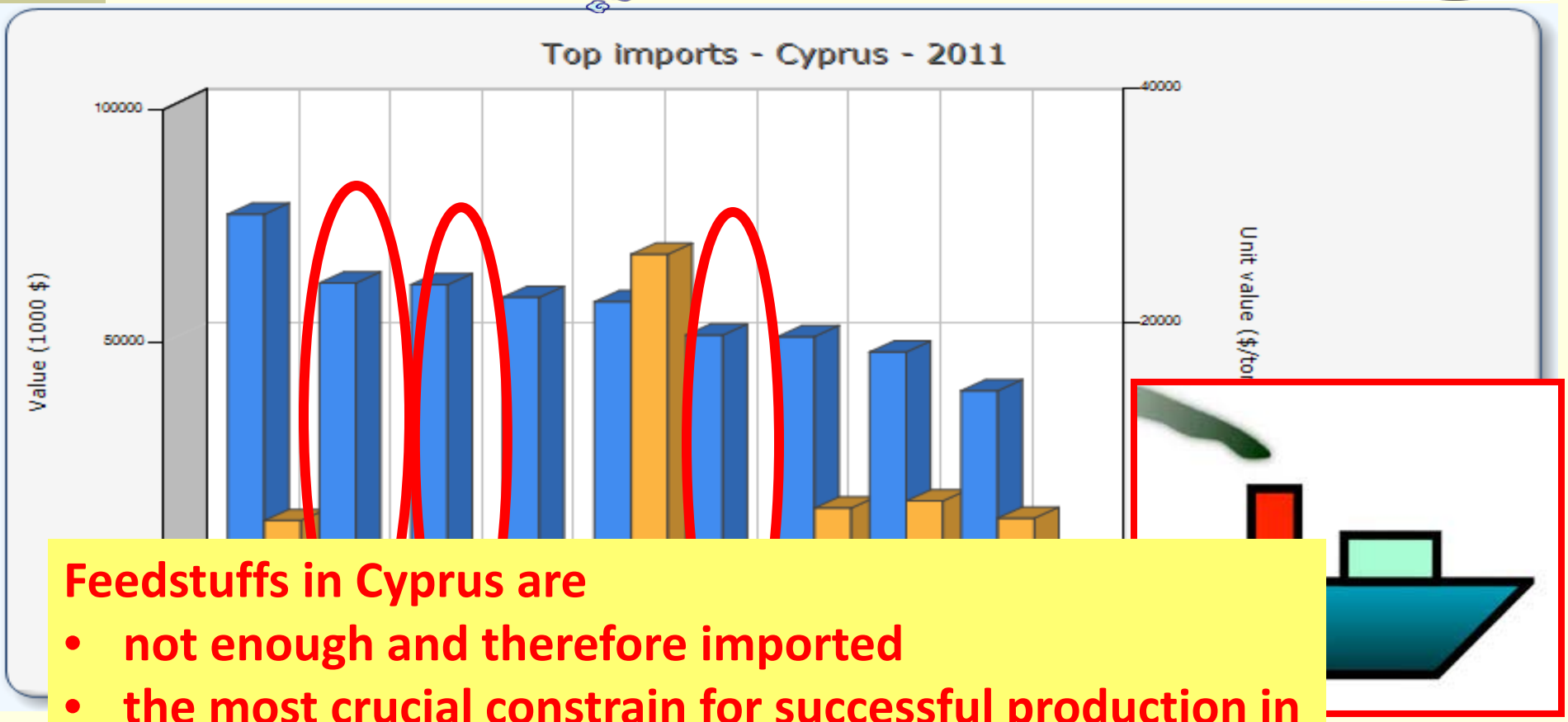
Why to do research on that subject in Cyprus ?



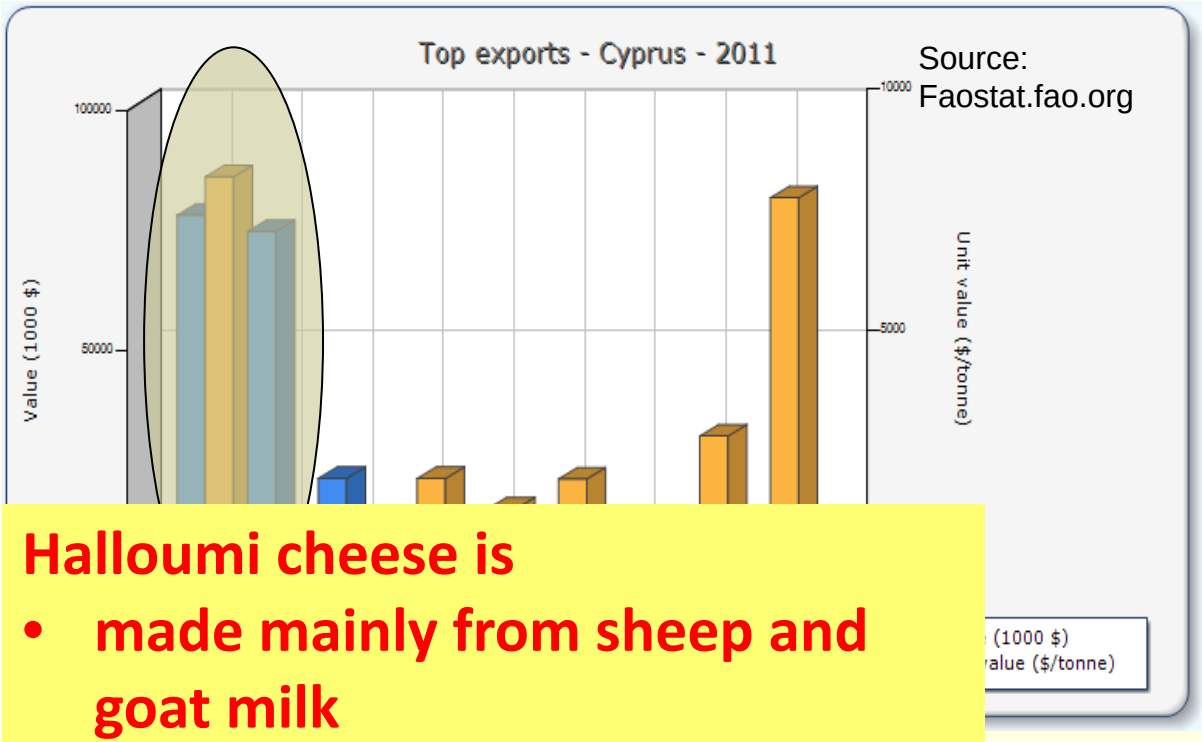
Feedstuffs in Cyprus are

- **not enough and therefore imported**
- **the most crucial constrain for successful production in dairy industry**

- there is a need for alternative feeds

Why to do research on that subject in Cyprus ?

the most important agricultural export of Cyprus is halloumi cheese



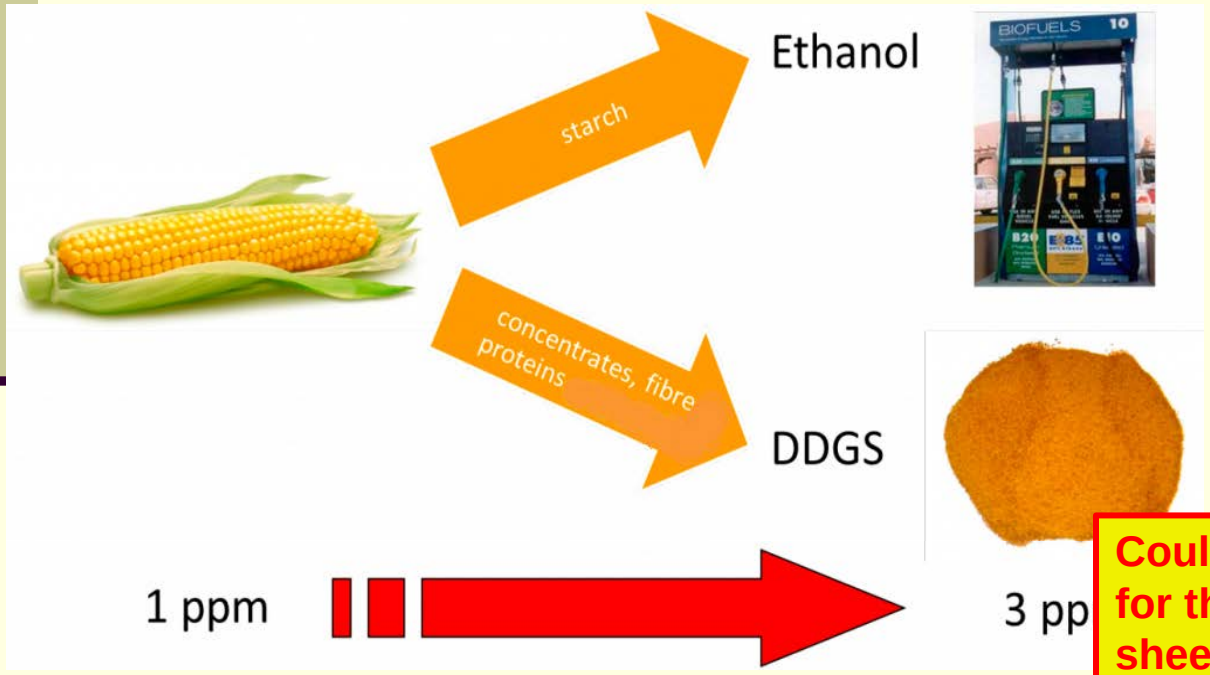
Halloumi cheese is

- **made mainly from sheep and goat milk**
- **is rich in fat (41% on DM basis)**

there is a need from the dairy industry to improve the fat profile of sheep milk

What is “Dried Distillers Grains with Solubles (DDGS)”

- Is the dried residue remaining after the starch fermentation with selected yeasts and enzymes to produce bio-ethanol



The main difference from the grain
- starch
- protein
- fat
- fiber
- yeast

Could we use this by-product for the improvement of sheep milk production and dairy lipids?

Material and methods

45 Chios ewes in mid-lactation were housed indoors and allocated to 3 iso-energetic and iso- nitrogenous feeding regimes:

- **G0 group**: no inclusion of DDGS
- **G10 group**: 10% inclusion of DDGS
- **G20 group**: 20% inclusion of DDGS

on DM basis

Monitoring

Milk Samples 5-week

Lactostar

GC - MS

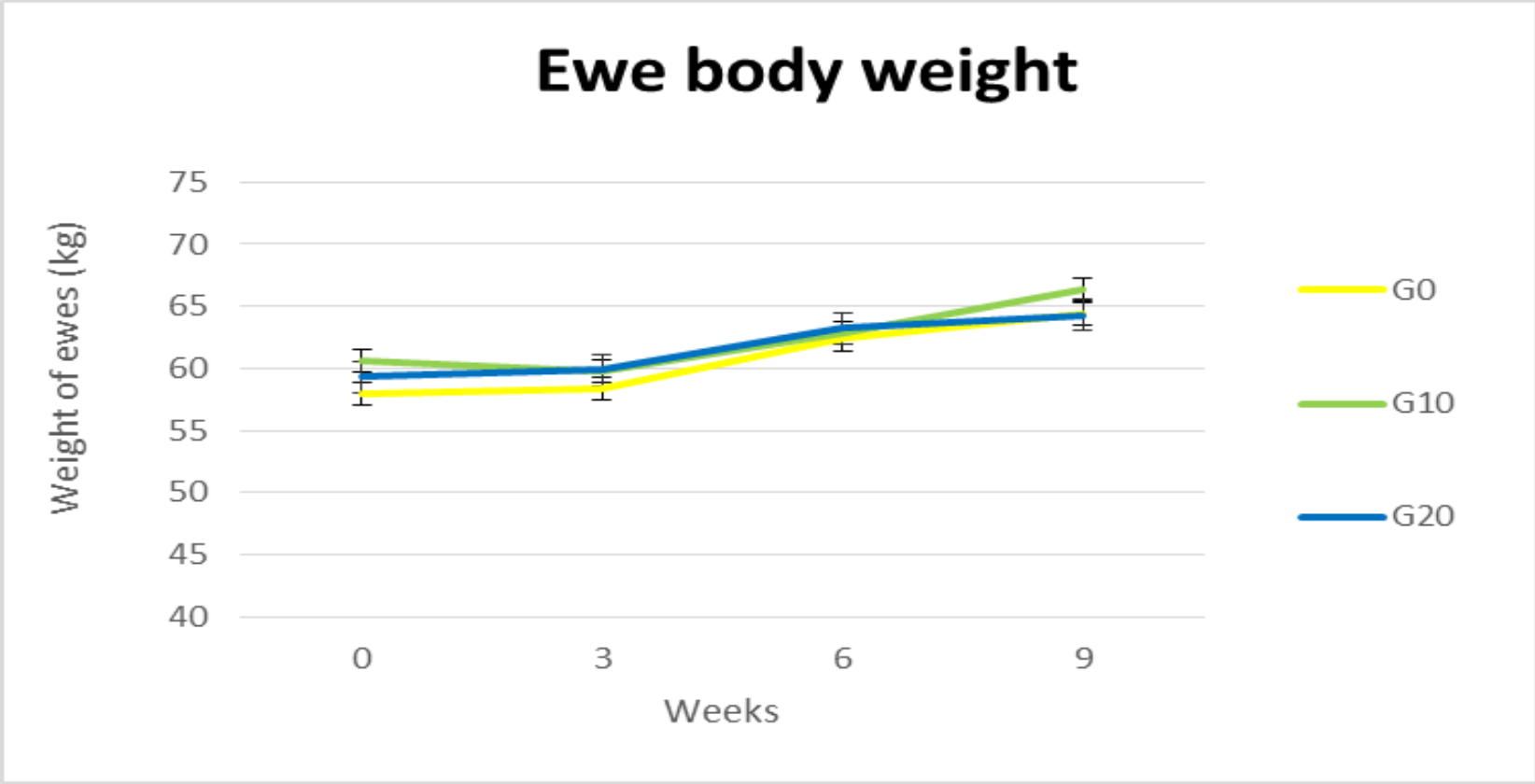
The experiment lasted for 9 weeks and BW, milk yield, feed intake were measured, whilst milk samples were taken during the first 5 weeks for analysis

Diet ingredients, % of DM	G0	G10	G20
Barley grain	26	26	26
Corn grain	**30,2**	**26,5**	**22,3**
Wheat bran	8	8	8
Sugar beet pulp	10	10	10
Soya meal 47%	**14**	**7,8**	**2**
MCP (monocalcium phosphate)	0,2	0	0
Vitamins and micro minerals	0,2	0,2	0,2
Sunflower 35%	8	8	8
DDGS from wheat	**0**	**10**	**20**
œgO	0,2	0,2	0,2
Sodium Biocarbonate	0,8	0	
Limestone	2,2	2	
Salt	0,2	0,2	0,2

1,8 kg concentrate
1,2 kg barley hay per animal

Chemical composition, % DM	G0	G10	G20
Protein	14,88	14,46	14,96
Cfibre	15,44	15,71	16,20
Ash	6,32	6,39	6,72
Fat	2,45	2,80	2,70
Ca	0,77	0,77	0,78
P	0,41	0,40	0,45
Na	0,30	0,31	0,31
Cl	0,42	0,42	0,43
S	0,19	0,20	0,20
Mg %	0,29	0,30	0,31
K %	1,46	1,40	1,36
ME MJ Rum.	10,92	10,95	10,91
NDF%	34,6	36,5	39,4
ADF%	19,1	20,0	20,8
% DM	88,00	88,00	88,00

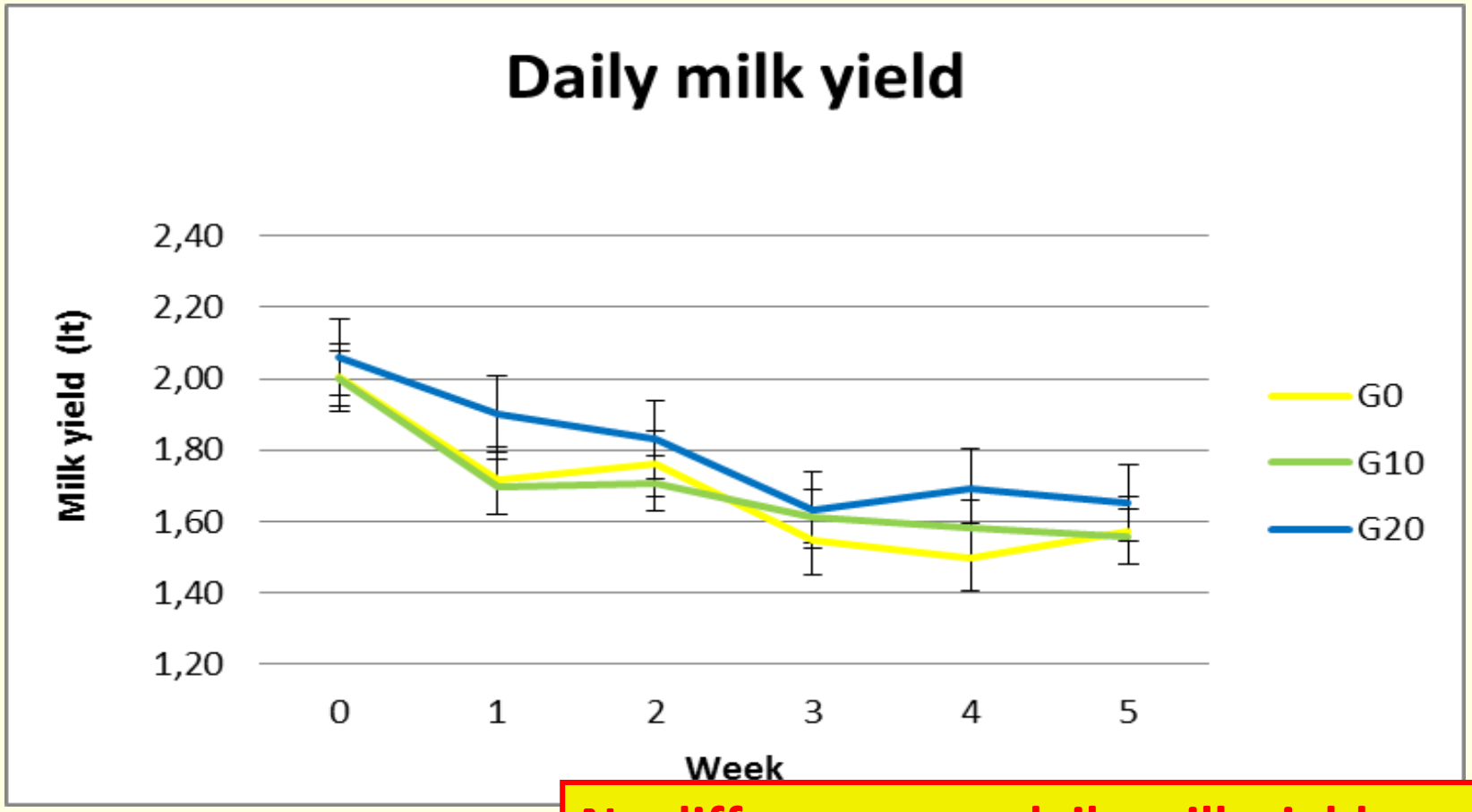
Results on body weight



Error bars are standard error of the mean, ***P<

No differences on weight

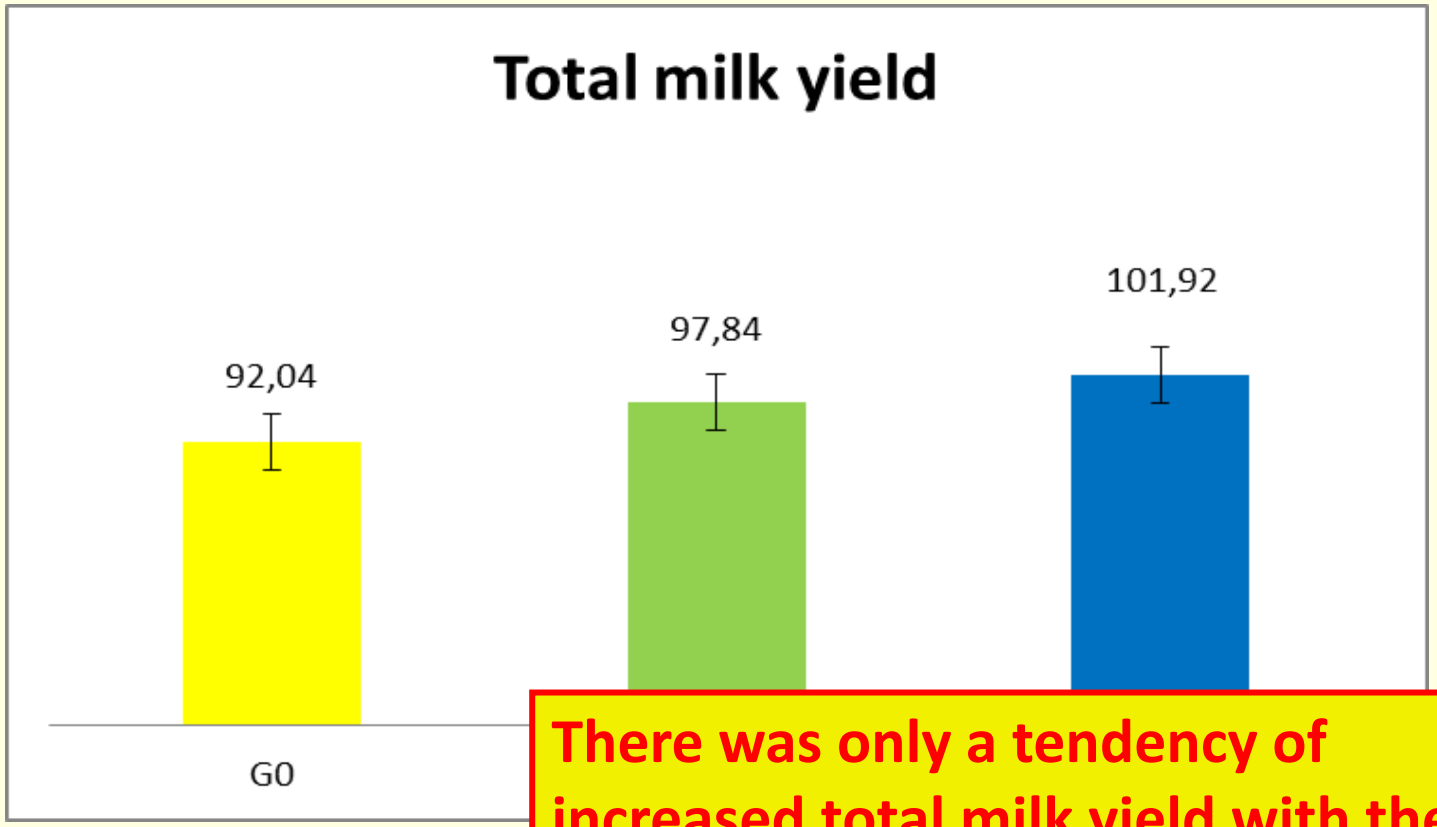
Results on daily milk yield



No differences on daily milk yield

Error bars are standard error of the mean, ***P<0,001, **P<0,01, *P<0,05

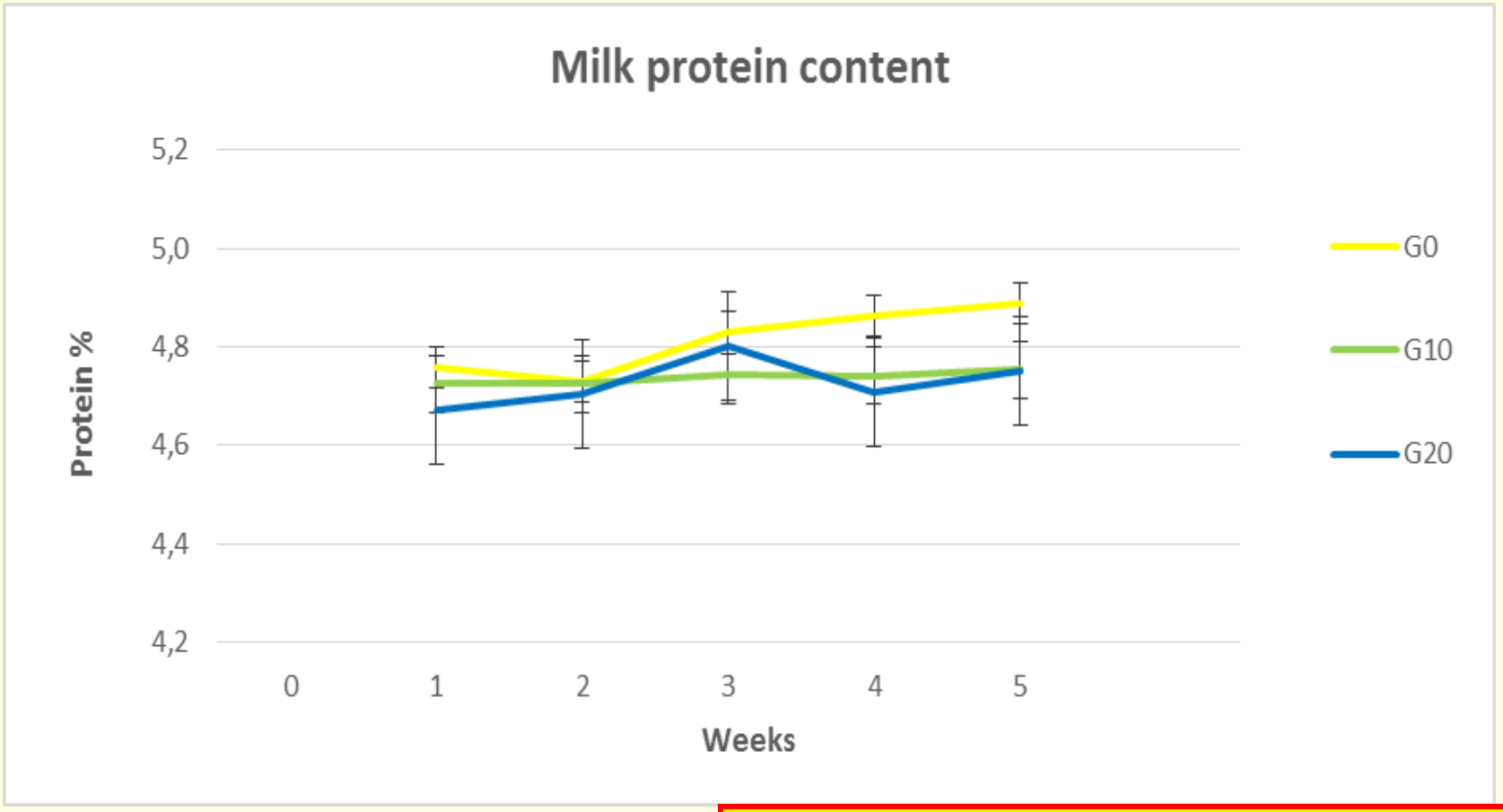
Results on milk yield for 9 weeks (lt per ewe)



There was only a tendency of increased total milk yield with the inclusion of DDGS

Error bars are standard error of the mean,

Results on milk constituents



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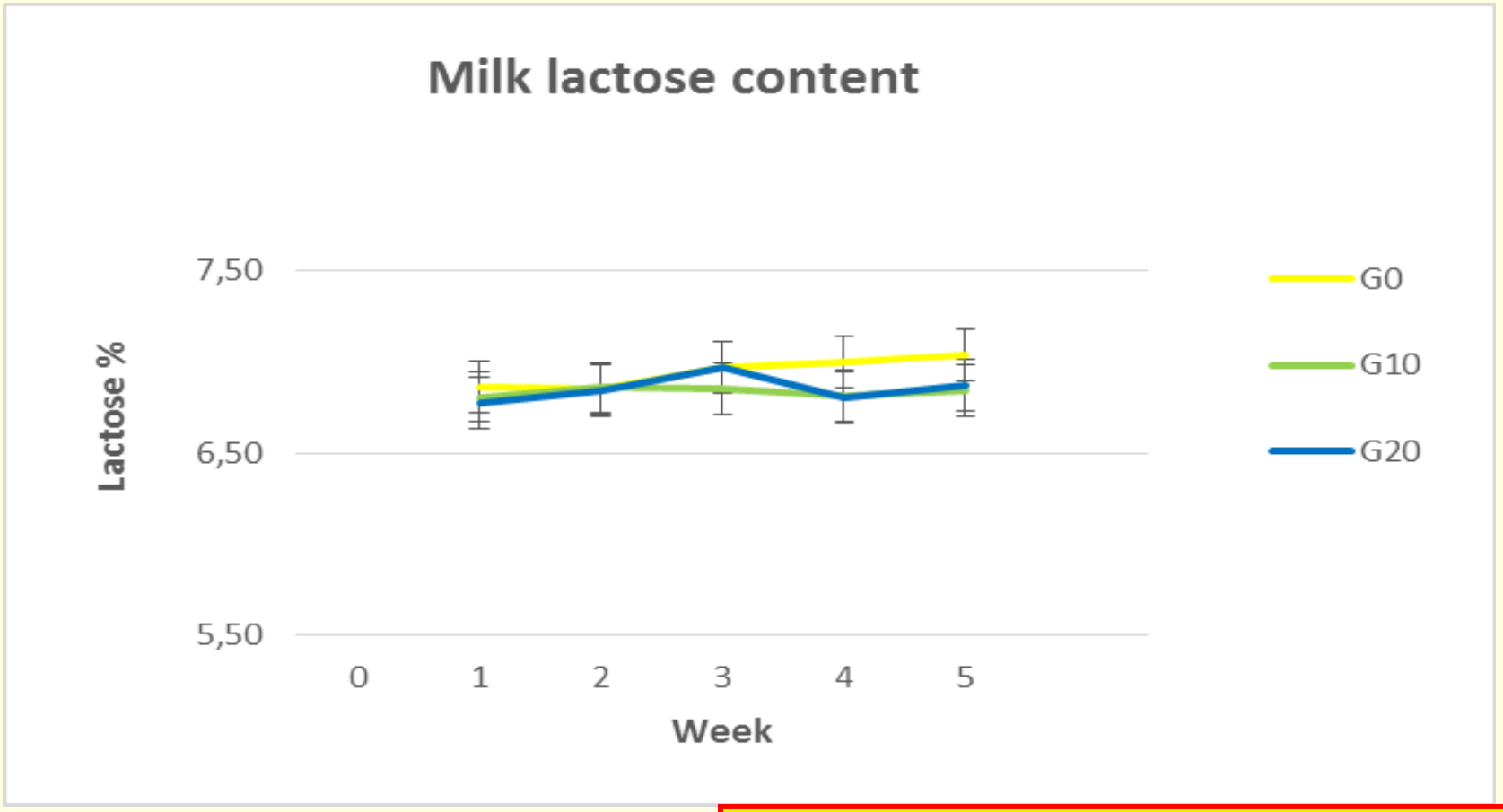
No differences on milk protein

Results on milk constituents



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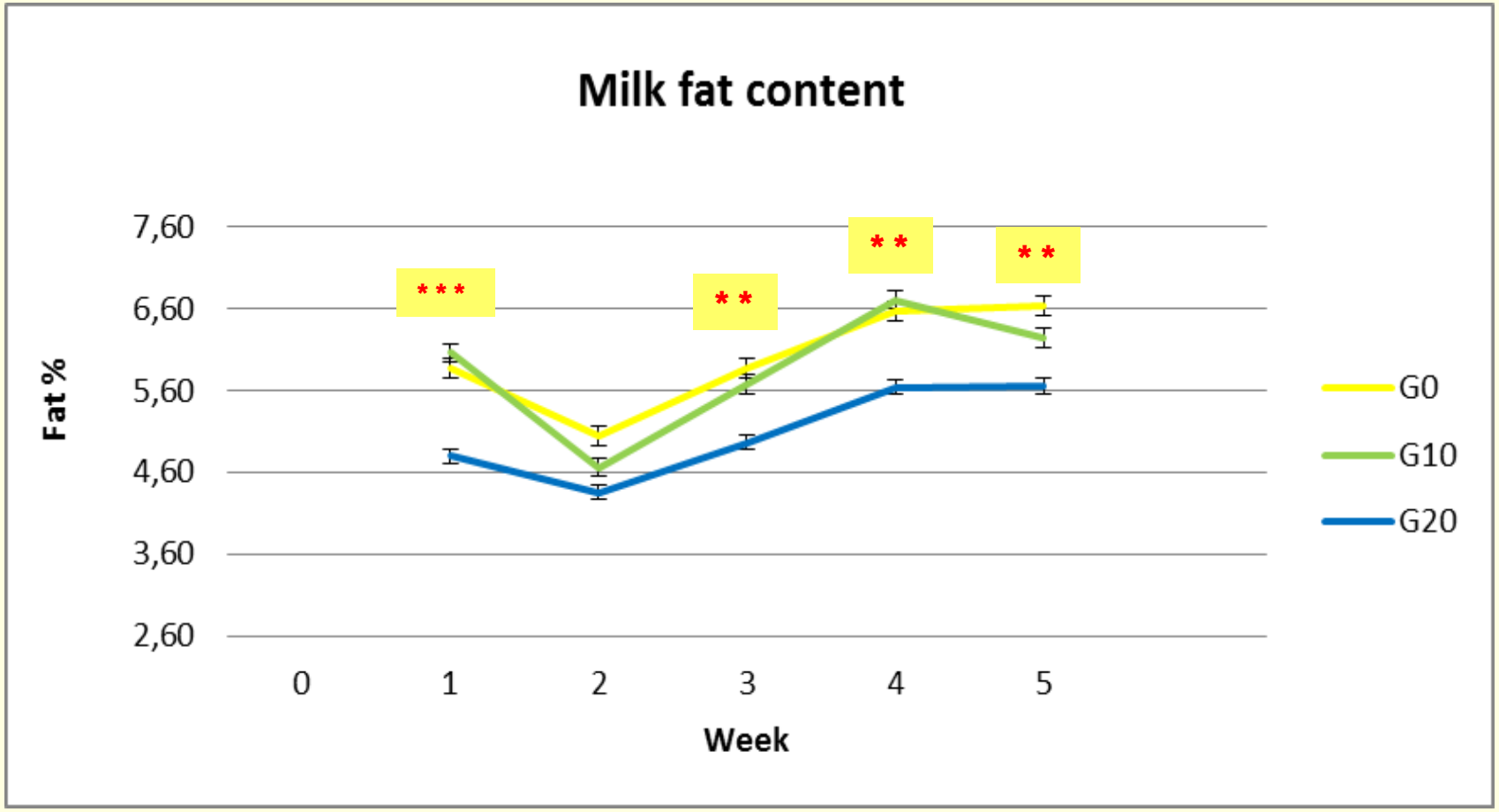
No differences on milk lactose

Results on milk constituents



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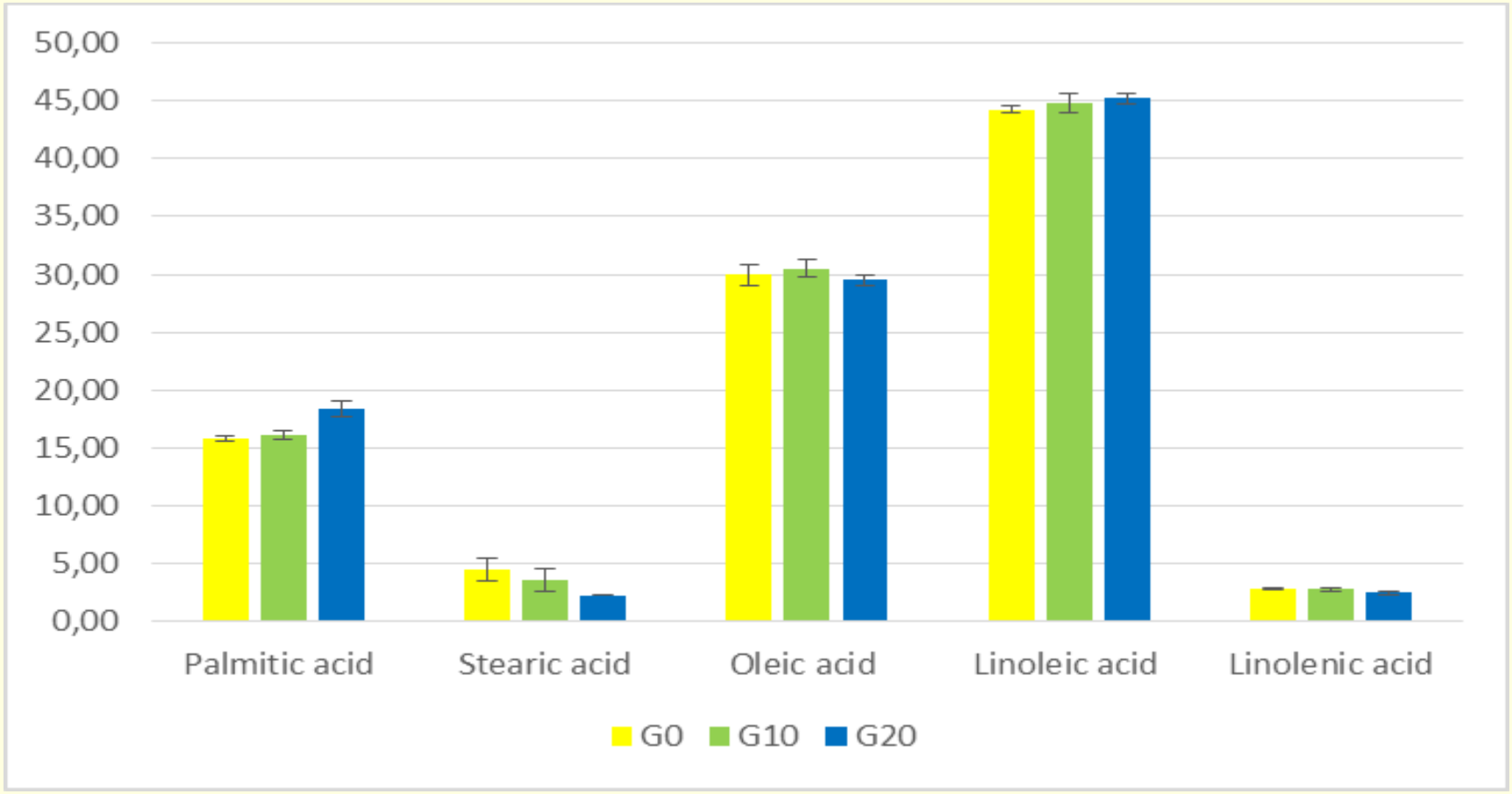
Results on production and main milk components

The inclusion of DDGS in lactating sheep did not affect

- milk yield
- feed consumption
- milk constituents apart from fat

- What about the quality of fat (fatty acid profile)?

Results on fatty acid profile of feed



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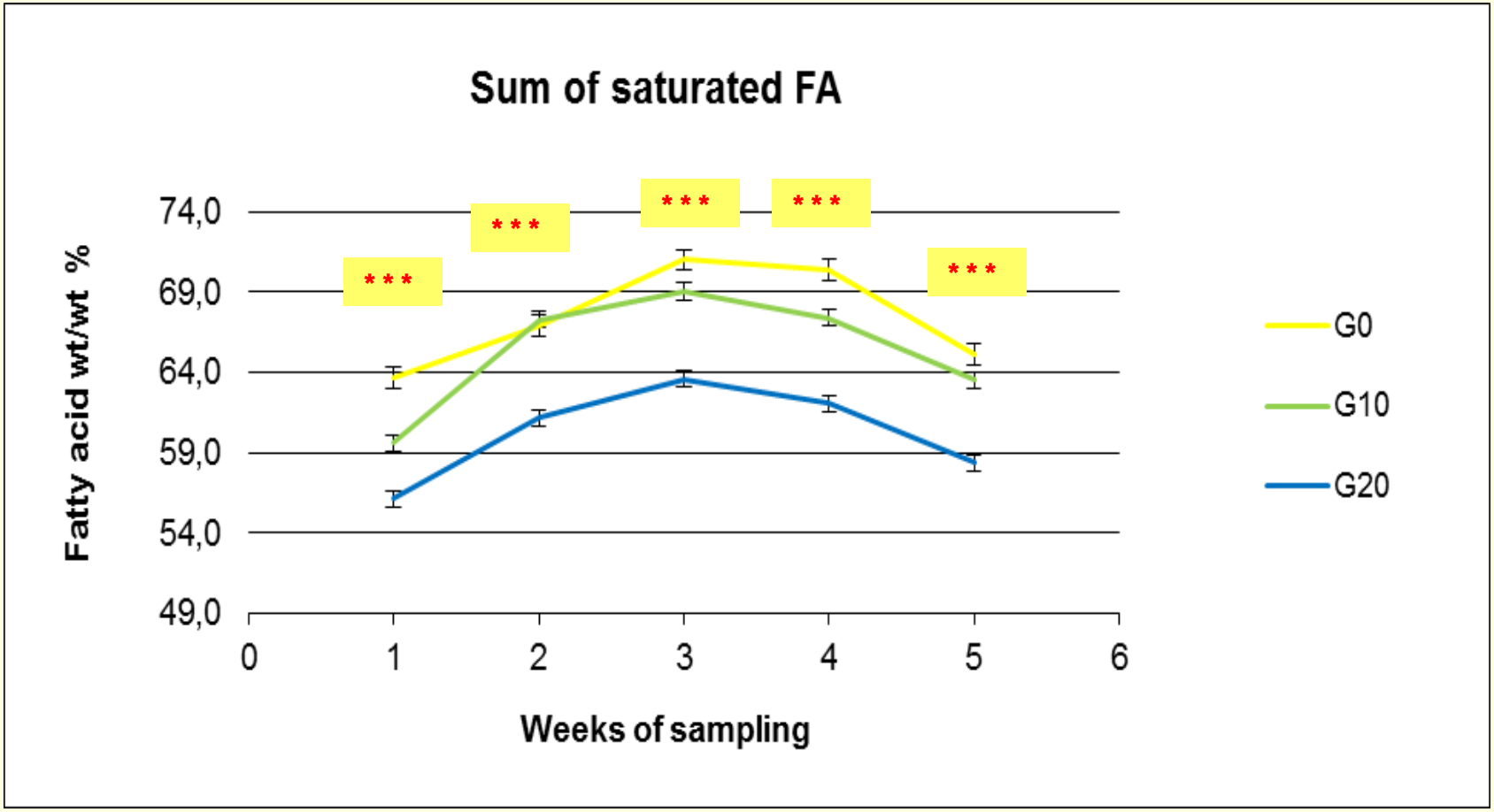
Results on fatty acid profile



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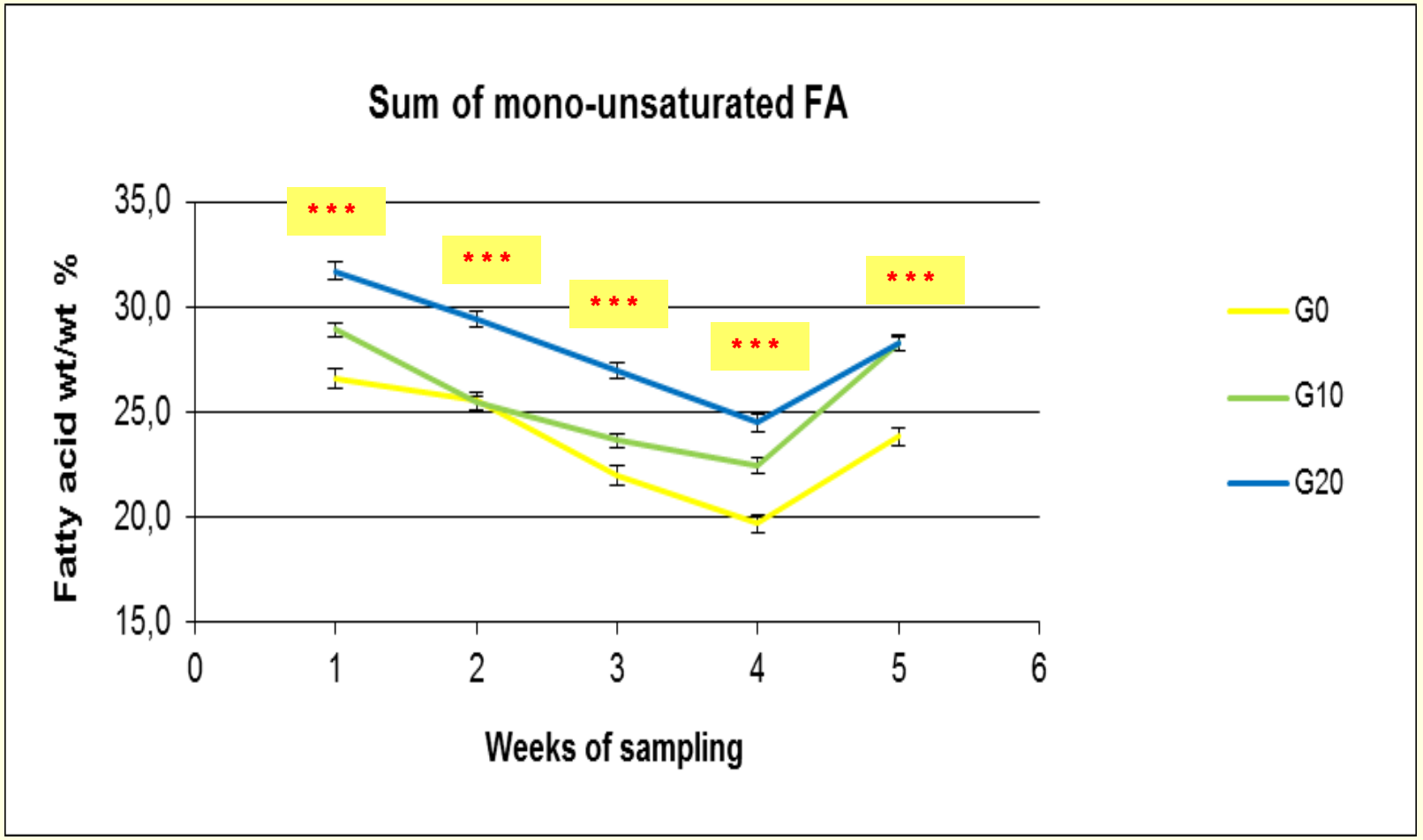

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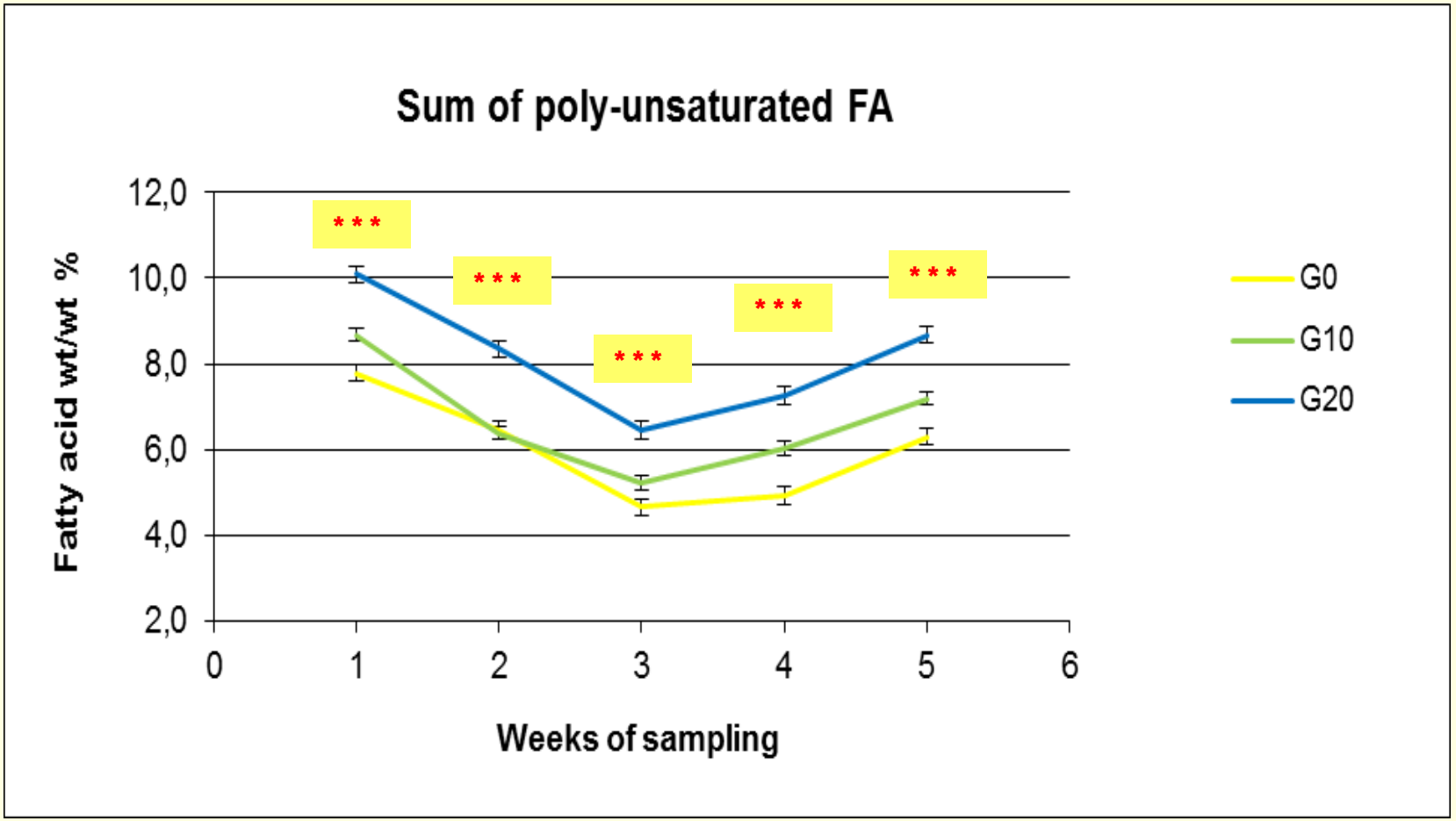

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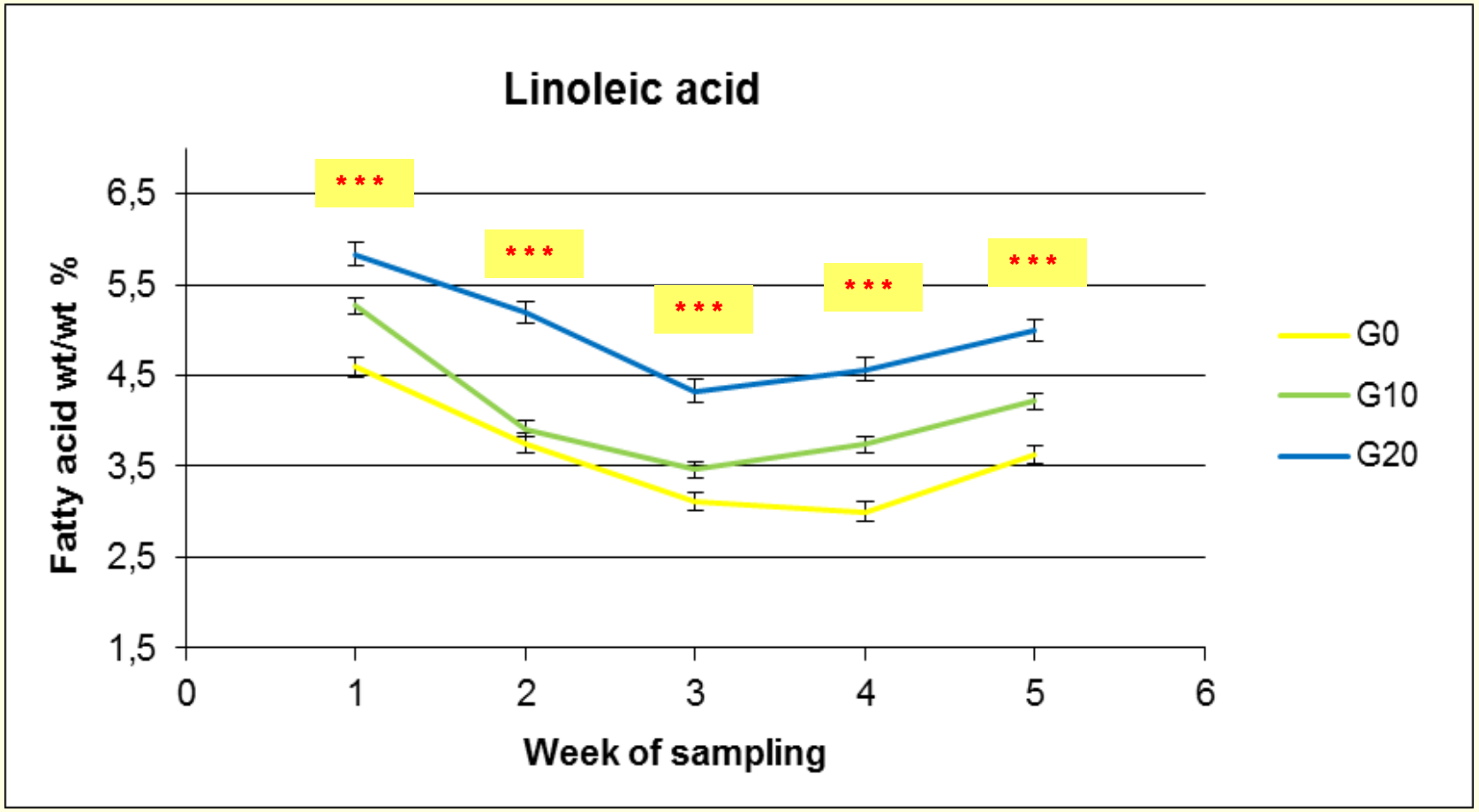

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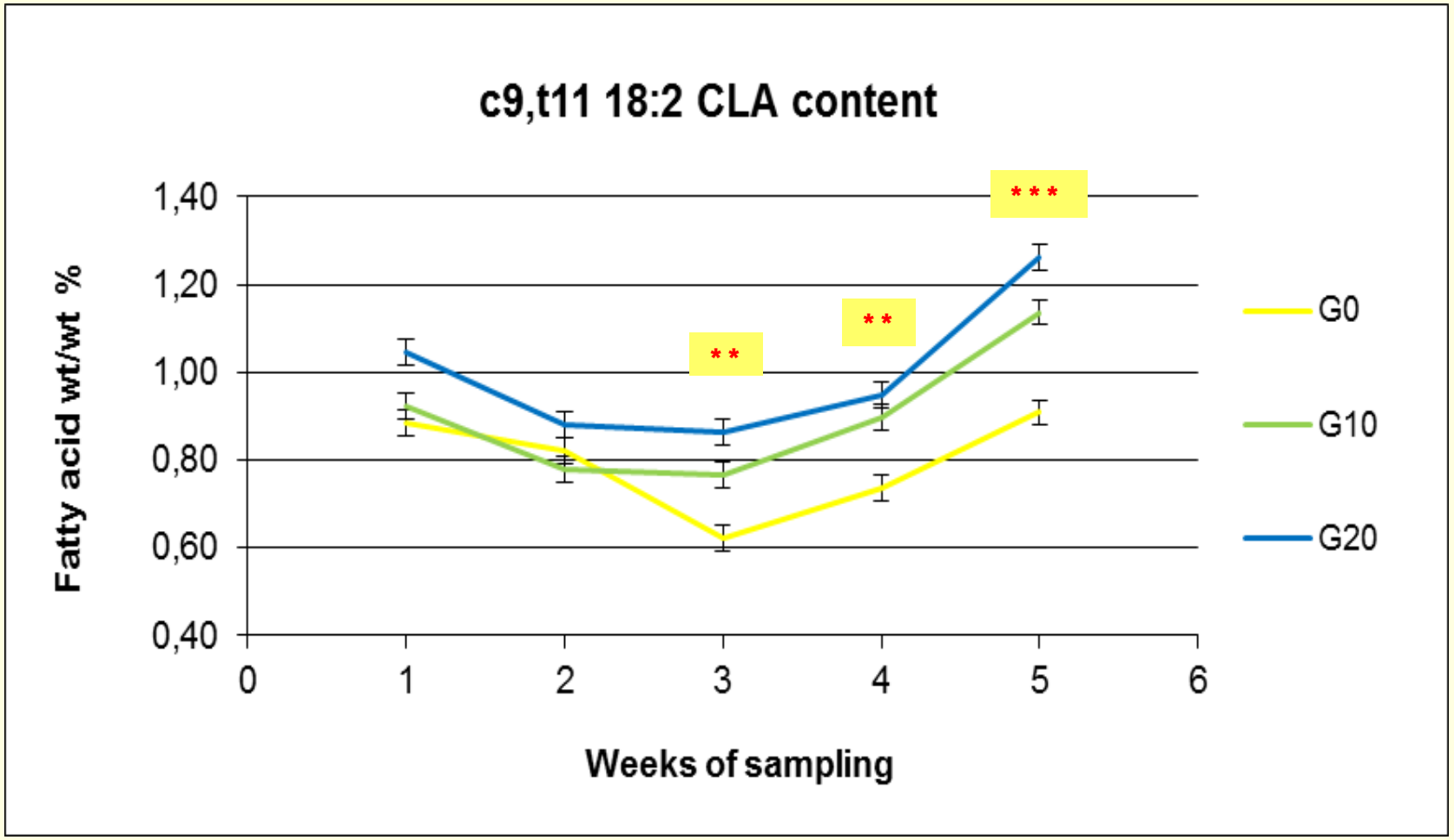

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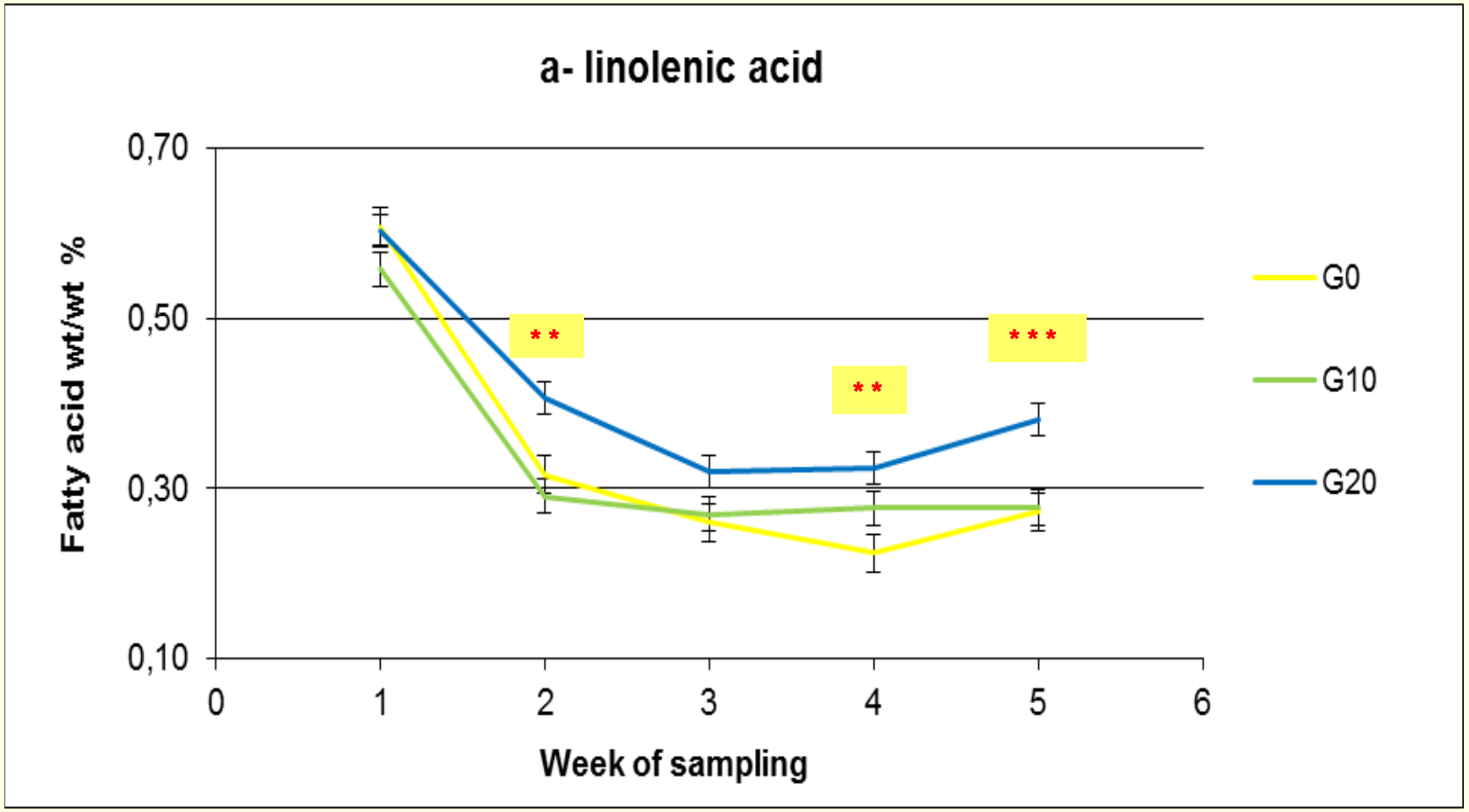
Results on fatty acid profile



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Conclusion regarding DDGS use in dairy sheep

The inclusion of DDGS in lactating sheep affected

- The fat content of milk
- The unsaturation index of ovine milk
- Particular FA, beneficial for human health, were increased (i.e. linoleic, CLA)

+ It is a cheap alternative to soya beans for sheep farmers without any advert effects on feed consumption or production when it is used up to 20% inclusion.

Acknowledgments

My colleagues

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- Mrs Constantina Constantinou
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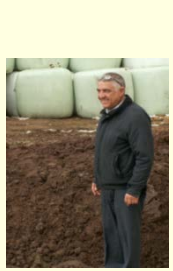
- Dr Christakis Papachristoforou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Thank you for your attention !