Milk yield and composition in dairy goats fed extruded flaxseed or a high-palmitic acid fat supplement

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Material and methods

Analyses of TMR and refusal samples

Pooled samples of TMR and refusals were first freeze-dried (VirTual^{TM} 50L, VirTis SP Scientific, Stone Ridge, NY, USA), and ground through a 1-mm screen (Wiley mill standard model 4; Arthur M. Thomas, Philadelphia, PA, USA). Ground samples of TMR were analysed for residual moisture (method 934.01; AOAC International, 2005), neutral detergent fibre (Ankom Technology method 6: NDF in feeds-filter bag technique for A200, with solutions as in Van Soest *et al*., 1991 and the inclusion of heat-stable α-amylase), acid detergent fibre (Ankom Technology, Fairport, NY; method 5: ADF in feeds filter bag technique for A200 with solutions as in method 973.18; AOAC International, 2005), crude protein (N × 6.25; method 990.03; AOAC International, 2005), and ash (method 942.05, AOAC International, 2005). The concentration of organic matter was calculated as the difference between 100 and the percentage of ash. The concentration of starch was determined colorimetrically according to the procedure described by Hall (2009).

Milk fatty acid analysis

Prior to analysis, milk samples were thawed in a water bath at 40°C and pooled by goat and period, proportionally to milk yield. Lipid extraction and methylation were performed according to the method of Rico *et al*. (2021). Milk FA composition was carried out by gas chromatography (Agilent 7890; Agilent Technologies, Santa Clara, CA, USA) using a CPSil-88 capillary column (100 m × 0.25 mm i.d. × 0.20 µm film; Agilent Technologies Canada Inc., Mississauga, ON, Canada) and a flame ionization detector. Three different temperature programs were used, as described by Boivin *et al*. (2013). The split ratio was 100:1. Most FA peaks were identified and quantified using either a quantitative mixture or pure methyl ester standards (Larodan Fine Chemicals, Malmö, Sweden; Sigma-Aldrich, Oakville, ON, Canada; Matreya LLC, Pleasant Gap, PA, USA; and Nu Chek Prep, Elysian, MN, USA). Fatty acids for which standards were not available commercially were identified by order of elution according to Kramer *et al*. (2008). Glycerol in milk fat was calculated as described by Schauff and Clark (1992).

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Table S1. Average ruminal pH and ruminal volatile fatty acid profile in dairy goats fed different lipid supplements from days 20 and 41 of the experimental period

Item	Treatment[1,2]			SEM	*P*-value
	CONT	PALM	FLAX		
pH	6.32	6.32	6.34	0.05	0.94
Total volatile fatty acids, mmol/L	81.0	82.6	84.9	6.0	0.87
Volatile fatty acids, mol/100 mol					
Acetate	62.2	62.7	62.8	1.2	0.84
Propionate	21.4	20.2	20.6	0.7	0.28
Isobutyrate	1.22	1.33	1.22	0.07	0.41
Butyrate	12.3	12.7	12.3	0.5	0.68
Isovalerate	1.31	1.48	1.29	0.08	0.18
Valerate	1.32	1.29	1.23	0.05	0.26
Caproate	0.43[a]	0.47[a]	0.37[b]	0.05	<0.01
Acetate:Propionate	3.03	3.23	3.15	0.18	0.57

[1]CONT: Unsupplemented control diet; PALM: Diet supplemented with palmitic acid; FLAX: Diet supplemented with extruded flaxseed.

[2]Within a row, means without a common superscript letter differ ($P \leq 0.05$).

Table S2. Milk fat and protein concentrations, along with *cis*-9, *cis*-12, *cis*-15 18:3 intake, concentration and secretion in milk fat, and apparent transfer efficiency from diet to milk, as well as total n-3 fatty acid secretion in milk fat, and transfer efficiency from diet to milk in dairy goats fed different lipid supplements.

| | Treatment[1,2]/Time[3] | | | | | | | | | | | | | | P-value | | |
| | CONT | | | | PALM | | | | FLAX | | | | | | | | |
Item	D0	D10	D20	D41	D0	D10	D20	D41	D0	D10	D20	D41	SEM	Time	Trt	Time×Trt
Milk fat concentration, %	4.30[a]	3.87[cd]	3.72[cd]	3.50[d]	4.30[a]	4.26[ab]	3.99[abc]	3.86[cd]	4.29[ab]	4.08[abc]	3.90[c]	3.93[bc]	0.09	<0.01	<0.01	0.03
Milk protein concentration, %	3.47[ab]	3.31[c]	3.31[c]	3.38[abc]	3.50[a]	3.32[bc]	3.27[c]	3.30[c]	3.48[a]	3.41[abc]	3.39[abc]	3.51[a]	0.04	<0.01	0.02	0.02
Intake of *cis*-9, *cis*-12, *cis*-15 18:3, g/day	22.1[b]	21.0[b]	20.5[b]	21.1[b]	21.3[b]	18.5[b]	19.9[b]	19.7[b]	21.6[b]	48.2[a]	52.3[a]	48.0[a]	1.6	<0.01	<0.01	<0.01
Milk *cis*-9, *cis*-12, *cis*-15 18:3, g/100 g fat	0.640[cde]	0.543[de]	0.785[bc]	0.627[cde]	0.619[cde]	0.498[e]	0.697[cd]	0.622[cde]	0.629[cde]	0.881[b]	1.201[a]	1.178[a]	0.052	<0.01	<0.01	<0.01
Milk *cis*-9, *cis*-12, *cis*-15 18:3, g/day	1.08[cd]	0.97[d]	1.40[bc]	1.0[cd]	1.0[cd]	0.98[cd]	1.30[bcd]	1.18[cd]	1.04[cd]	1.70[b]	2.27[a]	2.09[a]	0.19	<0.01	<0.01	<0.01
Transfer of *cis*-9, *cis*-12, *cis*-15 18:3, g secreted/100 g consumed	5.15[abcd]	4.92[bcd]	7.01[a]	4.89[bcd]	4.88[bcd]	5.48[abc]	6.59[ab]	6.07[abc]	5.14[abcd]	3.49[d]	4.26[cd]	4.39[cd]	0.53	<0.01	<0.01	<0.01
Milk total n-3 fatty acids, g/day	1.36[cd]	1.27[d]	1.84[bc]	1.28[d]	1.27[cd]	1.28[cd]	1.68[bcd]	1.50[bcd]	1.32[cd]	2.01[b]	2.74[a]	2.47[a]	0.22	<0.01	<0.01	<0.01
Transfer of total n-3 fatty acids, g secreted/100 g consumed	6.48[bcde]	6.38[bcde]	9.15[a]	6.23[bcde]	6.15[cde]	7.12[abcd]	8.50[ab]	7.68[abc]	6.57[bcd]	4.10[e]	5.12[de]	5.18[de]	0.63	<0.01	<0.01	<0.01

[1]CONT: Unsupplemented control diet; PALM: Diet supplemented with palmitic acid; FLAX: Diet supplemented with extruded flaxseed.

[2]Within a row, means without a common superscript letter differ ($P \leq 0.05$).

[3]Goats were subjected to repeated sampling intervals on the last 4 d of the pretreatment period (referred to as D0; data used as covariates), as well as during the experimental period on days 7 to 10, 17 to 20, and 28 to 41 (referred to as D10, D20, and D41, respectively).

Table S3. Milk fat composition in dairy goats fed different lipid supplements.

	Treatment[1,2]/Time[3]													*P*-value		
	CONT				PALM				FLAX							
Item, g/100 g fat	D0	D10	D20	D41	D0	D10	D20	D41	D0	D10	D20	D41	SEM	Time	Trt	Time×Trt
4:0	2.00^{ab}	1.89^{abcde}	1.82^{cde}	1.76^{de}	1.96^{abc}	2.07^{a}	1.98^{abc}	1.88^{bcde}	1.97^{abc}	2.03^{ab}	1.94^{abcd}	1.78^{e}	0.04	<0.01	0.06	0.01
6:0	2.02^{a}	1.92^{abc}	1.76^{cd}	1.79^{bcd}	1.98^{ab}	1.95^{abc}	1.73^{d}	1.72^{d}	1.99^{a}	2.08^{a}	1.92^{abc}	1.77^{cd}	0.04	<0.01	0.02	0.03
8:0	2.46^{ab}	2.37^{abc}	2.09^{def}	2.22^{bcde}	2.42^{ab}	2.24^{bcd}	1.90^{f}	1.95^{ef}	2.43^{ab}	2.55^{a}	2.24^{bcd}	2.09^{cdef}	0.06	<0.01	<0.01	<0.01
10:0	9.78^{ab}	10.16^{a}	8.85^{bc}	9.67^{ab}	9.96^{ab}	8.99^{abc}	7.55^{d}	7.99^{cd}	9.83^{ab}	9.56^{ab}	8.18^{cd}	8.01^{cd}	0.28	<0.01	<0.01	<0.01
10:1	0.159^{b}	0.172^{ab}	0.160^{b}	0.196^{a}	0.160^{b}	0.157^{b}	0.145^{b}	0.162^{b}	0.167^{ab}	0.175^{ab}	0.159^{b}	0.157^{b}	0.008	<0.01	0.06	0.02
11:0	0.132^{abcd}	0.169^{a}	0.109^{bcde}	0.130^{abcde}	0.139^{abc}	0.126^{abcde}	0.091^{de}	0.099^{cde}	0.144^{ab}	0.120^{bcde}	0.092^{de}	0.088^{e}	0.010	<0.01	<0.01	<0.01
12:0	5.53^{abcd}	6.11^{a}	5.49^{abcd}	6.05^{a}	5.91^{ab}	5.40^{abcde}	4.74^{def}	5.08^{cdef}	5.68^{abc}	5.07^{bcdef}	4.50^{f}	4.52^{ef}	0.20	<0.01	<0.01	<0.01
cis-9 12:1	0.112^{cd}	0.140^{ab}	0.133^{bcd}	0.163^{a}	0.116^{bcd}	0.124^{bcd}	0.114^{bcd}	0.132^{abc}	0.116^{bcd}	0.109^{bcd}	0.100^{d}	0.106^{cd}	0.007	<0.01	<0.01	<0.01
iso C13:0	0.018^{a}	0.022^{a}	0.019^{a}	0.019^{a}	0.017^{a}	0.021^{a}	0.016^{a}	0.017^{a}	0.018^{a}	0.023^{a}	0.017^{a}	0.017^{a}	0.002	<0.01	0.55	0.98
anteiso C13:0	0.011^{b}	0.019^{ab}	0.010^{b}	0.015^{ab}	0.013^{b}	0.024^{a}	0.010^{b}	0.015^{ab}	0.014^{ab}	0.020^{ab}	0.012^{b}	0.011^{b}	0.003	<0.01	0.57	0.64
13:0	0.102^{abcd}	0.122^{a}	0.088^{bcde}	0.099^{abcde}	0.105^{abc}	0.092^{bcde}	0.077^{de}	0.081^{cde}	0.109^{ab}	0.090^{bcde}	0.074^{e}	0.076^{de}	0.006	<0.01	<0.01	<0.01
iso C14:0	0.088^{a}	0.080^{ab}	0.078^{ab}	0.086^{ab}	0.085^{ab}	0.075^{ab}	0.071^{b}	0.082^{ab}	0.086^{ab}	0.074^{ab}	0.074^{ab}	0.074^{ab}	0.004	<0.01	0.06	0.70
14:0	11.5^{abcd}	11.9^{abc}	11.3^{bcde}	12.5^{a}	11.9^{ab}	10.9^{cdef}	10.1^{fg}	10.8^{cdef}	11.8^{abc}	10.6^{defg}	9.7^{g}	10.2^{efg}	0.2	<0.01	<0.01	<0.01
cis-9 14:1	0.132^{def}	0.156^{bc}	0.156^{bc}	0.196^{a}	0.133^{cdef}	0.140^{cd}	0.138^{cde}	0.173^{ab}	0.134^{cde}	0.112^{ef}	0.109^{f}	0.126^{def}	0.006	<0.01	<0.01	<0.01
cis-11 14:1	0.127^{b}	0.151^{b}	0.153^{b}	0.191^{a}	0.129^{b}	0.133^{b}	0.134^{b}	0.151^{b}	0.129^{b}	0.120^{b}	0.120^{b}	0.131^{b}	0.008	<0.01	<0.01	<0.01
iso C15:0	0.138^{ab}	0.130^{abc}	0.126^{abc}	0.133^{abc}	0.137^{ab}	0.117^{abc}	0.117^{abc}	0.120^{abc}	0.137^{a}	0.112^{c}	0.115^{bc}	0.118^{abc}	0.005	<0.01	0.02	0.63
anteiso C15:0	0.284^{a}	0.294^{a}	0.296^{a}	0.285^{a}	0.286^{a}	0.255^{a}	0.271^{a}	0.262^{a}	0.288^{a}	0.267^{a}	0.290^{a}	0.271^{a}	0.012	0.06	<0.01	0.29
15:0	0.817^{abc}	0.888^{a}	0.758^{bcde}	0.794^{abcd}	0.821^{ab}	0.707^{cde}	0.663^{e}	0.694^{de}	0.841^{ab}	0.684^{de}	0.658^{e}	0.664^{e}	0.026	<0.01	<0.01	<0.01
iso C16:0	0.256^{a}	0.249^{a}	0.337^{a}	0.322^{a}	0.251^{a}	0.256^{a}	0.263^{a}	0.289^{a}	0.253^{a}	0.274^{a}	0.273^{a}	0.266^{a}	0.023	0.03	0.14	0.21
16:0	24.6^{d}	25.8^{cd}	25.0^{d}	27.5^{bc}	24.6^{d}	29.6^{a}	28.4^{ab}	30.2^{a}	24.7^{d}	21.2^{e}	20.2^{e}	21.9^{e}	0.4	<0.01	<0.01	<0.01
trans-9 16:1	0.055^{bc}	0.046^{bc}	0.050^{bc}	0.042^{c}	0.051^{bc}	0.050^{bc}	0.057^{bc}	0.050^{bc}	0.050^{bc}	0.068^{b}	0.091^{a}	0.095^{a}	0.005	<0.01	<0.01	<0.01
iso C17:0[4]	0.244^{a}	0.215^{ab}	0.241^{ab}	0.203^{ab}	0.240^{ab}	0.201^{ab}	0.206^{ab}	0.183^{b}	0.235^{ab}	0.202^{ab}	0.235^{ab}	0.213^{ab}	0.013	<0.01	0.13	0.70
cis-9 16:1	0.456^{cd}	0.450^{cde}	0.486^{bc}	0.495^{bc}	0.452^{cde}	0.573^{ab}	0.597^{a}	0.649^{a}	0.469^{cd}	0.356^{e}	0.387^{de}	0.414^{cde}	0.022	<0.01	<0.01	<0.01
anteiso C17:0[5]	0.368^{b}	0.350^{b}	0.437^{a}	0.375^{ab}	0.369^{ab}	0.327^{b}	0.383^{ab}	0.355^{b}	0.368^{ab}	0.342^{b}	0.390^{ab}	0.379^{ab}	0.015	<0.01	0.21	0.38
cis-11 16:1	0.018^{a}	0.019^{a}	0.019^{a}	0.023^{a}	0.017^{a}	0.020^{a}	0.017^{a}	0.022^{a}	0.017^{a}	0.018^{a}	0.020^{a}	0.017^{a}	0.002	0.11	0.47	0.22
cis-13 16:1	0.204^{cdef}	0.231^{bcd}	0.253^{ab}	0.295^{a}	0.207^{bcdef}	0.186^{def}	0.195^{cdef}	0.232^{bc}	0.209^{bcde}	0.161^{f}	0.174^{ef}	0.198^{cdef}	0.012	<0.01	<0.01	<0.01
17:0	0.237^{ab}	0.215^{abcdef}	0.244^{a}	0.194^{cdefg}	0.225^{abcd}	0.177^{fg}	0.215^{abcde}	0.187^{efg}	0.230^{abc}	0.174^{g}	0.206^{bcdefg}	0.194^{defg}	0.008	<0.01	<0.01	0.10

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| | Treatment[1,2]/Time[3] | | | | | | | | | | | | | P-value | | |
| | CONT | | | | PALM | | | | FLAX | | | | | | | |
Item, g/100 g fat	D0	D10	D20	D41	D0	D10	D20	D41	D0	D10	D20	D41	SEM	Time	Trt	Time×Trt
cis-7 17:1	0.012^{a}	0.013^{a}	0.013^{a}	0.013^{a}	0.011^{a}	0.013^{a}	0.011^{a}	0.013^{a}	0.011^{a}	0.010^{a}	0.010^{a}	0.011^{a}	0.001	0.67	0.02	0.87
cis-8 17:1	0.008^{a}	0.002^{a}	0.004^{a}	0.002^{a}	0.005^{a}	0.004^{a}	0.005^{a}	0.006^{a}	0.005^{a}	0.004^{a}	0.005^{a}	0.001^{a}	0.002	0.15	0.13	0.23
cis-9 17:1	0.096^{ab}	0.082^{abcd}	0.096^{ab}	0.076^{abcd}	0.091^{abcd}	0.078^{abcd}	0.094^{abc}	0.087^{abcd}	0.099^{a}	0.065^{d}	0.071^{bcd}	0.067^{cd}	0.007	<0.01	<0.01	0.10
iso C18:0	0.018^{ab}	0.014^{ab}	0.024^{a}	0.009^{b}	0.015^{ab}	0.011^{b}	0.016^{ab}	0.011^{b}	0.015^{ab}	0.013^{b}	0.017^{ab}	0.014^{ab}	0.003	<0.01	0.28	0.22
18:0	5.37^{bcd}	4.44^{defg}	5.30^{cd}	3.68^{g}	5.10^{cde}	4.15^{efg}	5.25^{cd}	4.10^{fg}	5.13^{cdef}	6.10^{bc}	7.16^{a}	6.44^{ab}	0.24	<0.01	<0.01	<0.01
trans-4 18:1	0.010^{bc}	0.016^{abc}	0.013^{abc}	0.014^{abc}	0.011^{bc}	0.013^{bc}	0.012^{bc}	0.011^{bc}	0.010^{c}	0.020^{a}	0.017^{ab}	0.015^{abc}	0.002	<0.01	0.02	0.10
trans-5 18:1	0.012^{bc}	0.020^{a}	0.014^{abc}	0.015^{abc}	0.012^{bc}	0.018^{ab}	0.014^{abc}	0.013^{abc}	0.011^{c}	0.020^{a}	0.018^{ab}	0.016^{abc}	0.002	<0.01	0.47	0.52
trans-6-8 18:1	0.160^{cdef}	0.201^{bcd}	0.190^{bcde}	0.131^{f}	0.151^{def}	0.187^{bcde}	0.204^{bc}	0.147^{ef}	0.144^{ef}	0.277^{a}	0.283^{a}	0.229^{b}	0.011	<0.01	<0.01	<0.01
trans-9 18:1	0.349^{cd}	0.453^{abc}	0.418^{bcd}	0.292^{d}	0.324^{cd}	0.421^{bcd}	0.446^{abc}	0.321^{cd}	0.297^{cd}	0.579^{a}	0.512^{ab}	0.406^{bcd}	0.035	<0.01	0.02	0.02
trans-10 18:1	0.211^{ef}	0.331^{bc}	0.286^{cde}	0.184^{f}	0.204^{f}	0.295^{cd}	0.254^{def}	0.195^{f}	0.193^{f}	0.446^{a}	0.371^{b}	0.339^{bc}	0.017	<0.01	<0.01	<0.01
trans-11 18:1	0.696^{cd}	0.514^{def}	0.534^{def}	0.428^{f}	0.662^{cd}	0.451^{ef}	0.652^{cd}	0.485^{def}	0.660^{cde}	0.800^{bc}	1.093^{a}	0.974^{ab}	0.048	<0.01	<0.01	<0.01
trans-12 18:1	0.212^{b}	0.203^{b}	0.201^{b}	0.144^{b}	0.200^{b}	0.160^{b}	0.212^{b}	0.133^{b}	0.199^{b}	0.434^{a}	0.523^{a}	0.398^{a}	0.036	<0.01	<0.01	<0.01
trans-13-14 18:1	0.316^{abcd}	0.274^{bcd}	0.203^{cd}	0.112^{d}	0.278^{bcd}	0.117^{d}	0.184^{cd}	0.101^{d}	0.272^{bcd}	0.677^{ab}	0.740^{a}	0.598^{abc}	0.096	0.44	<0.01	0.01
trans-15 18:1	0.353^{cd}	0.456^{c}	0.292^{d}	0.426^{cd}	0.363^{cd}	0.456^{c}	0.294^{d}	0.393^{cd}	0.348^{cd}	0.925^{a}	0.718^{b}	0.775^{b}	0.035	<0.01	<0.01	<0.01
trans-16 18:1	0.218^{b}	0.202^{b}	0.239^{b}	0.176^{b}	0.219^{b}	0.159^{b}	0.209^{b}	0.185^{b}	0.214^{b}	0.519^{a}	0.572^{a}	0.548^{a}	0.021	<0.01	<0.01	<0.01
cis-6-8 18:1	0.118^{a}	0.156^{a}	0.128^{a}	0.112^{a}	0.096^{a}	0.141^{a}	0.134^{a}	0.138^{a}	0.099^{a}	0.176^{a}	0.141^{a}	0.198^{a}	0.024	0.05	0.05	0.45
cis-9 18:1[6]	11.4^{abcd}	9.5^{d}	12.6^{abc}	9.9^{cd}	10.8^{bcd}	10.1^{cd}	13.1^{ab}	11.6^{abcd}	11.3^{abcd}	11.0^{bcd}	14.0^{a}	13.4^{ab}	0.8	<0.01	<0.01	0.19
cis-11 18:1	0.561^{cd}	0.846^{ab}	0.500^{d}	0.675^{abcd}	0.609^{bcd}	0.767^{abc}	0.497^{d}	0.650^{bcd}	0.611^{bcd}	0.902^{a}	0.472^{d}	0.664^{abcd}	0.056	<0.01	0.74	0.66
cis-12 18:1	0.312^{d}	0.460^{cd}	0.275^{d}	0.403^{d}	0.318^{d}	0.423^{d}	0.277^{d}	0.362^{d}	0.298^{d}	0.926^{a}	0.632^{bc}	0.767^{ab}	0.045	<0.01	<0.01	<0.01
cis-13 18:1	0.093^{bc}	0.130^{bc}	0.046^{c}	0.091^{bc}	0.095^{bc}	0.099^{bc}	0.056^{c}	0.094^{bc}	0.090^{bc}	0.309^{a}	0.099^{bc}	0.200^{ab}	0.026	<0.01	<0.01	<0.01
cis-14 18:1	0.046^{d}	0.065^{bcd}	0.046^{d}	0.036^{d}	0.041^{d}	0.064^{bcd}	0.049^{cd}	0.037^{d}	0.041^{d}	0.145^{a}	0.100^{b}	0.088^{bc}	0.009	<0.01	<0.01	<0.01
cis-15 18:1	0.100^{c}	0.061^{c}	0.071^{c}	0.081^{c}	0.095^{c}	0.064^{c}	0.084^{c}	0.102^{c}	0.096^{c}	0.345^{b}	0.342^{b}	0.431^{a}	0.017	<0.01	<0.01	<0.01
cis-9, *cis*-12 18:2	1.50^{d}	1.49^{d}	1.97^{a}	1.59^{cd}	1.46^{d}	1.41^{d}	1.88^{abc}	1.65^{bcd}	1.46^{d}	1.50^{d}	1.92^{ab}	1.85^{abc}	0.07	<0.01	0.29	0.24
cis-9, *trans*-11 18:2[7]	0.249^{b}	0.197^{b}	0.267^{b}	0.201^{b}	0.250^{b}	0.176^{b}	0.284^{b}	0.228^{b}	0.254^{b}	0.263^{b}	0.449^{a}	0.431^{a}	0.026	<0.01	<0.01	<0.01
cis-9, *trans*-12 18:2	0.055^{c}	0.065^{c}	0.069^{c}	0.055^{c}	0.054^{c}	0.054^{c}	0.060^{c}	0.052^{c}	0.053^{c}	0.115^{b}	0.145^{a}	0.133^{a}	0.004	<0.01	<0.01	<0.01
trans-8, *cis*-12 18:2	0.225^{c}	0.209^{c}	0.257^{c}	0.222^{c}	0.227^{c}	0.198^{c}	0.260^{c}	0.230^{c}	0.227^{c}	0.518^{b}	0.580^{ab}	0.595^{a}	0.019	<0.01	<0.01	<0.01
trans-8, *cis*-13 18:2	0.076^{c}	0.087^{c}	0.101^{c}	0.077^{c}	0.076^{c}	0.111^{c}	0.107^{c}	0.094^{c}	0.076^{c}	0.195^{b}	0.253^{a}	0.253^{a}	0.010	<0.01	<0.01	<0.01
trans-9, *trans*-12 18:2	0.020^{c}	0.022^{bc}	0.029^{bc}	0.022^{bc}	0.022^{c}	0.024^{bc}	0.029^{bc}	0.019^{c}	0.020^{c}	0.051^{a}	0.040^{ab}	0.053^{a}	0.004	<0.01	<0.01	<0.01
trans-9, *cis*-12 18:2	0.043^{cd}	0.052^{cd}	0.059^{bc}	0.045^{cd}	0.043^{cd}	0.047^{cd}	0.058^{bc}	0.047^{cd}	0.039^{d}	0.087^{a}	0.081^{a}	0.070^{ab}	0.004	<0.01	<0.01	<0.01

| Item, g/100 g fat | Treatment[1,2]/Time[3] | | | | | | | | | | | | SEM | P-value | | |
| | CONT | | | | PALM | | | | FLAX | | | | | Time | Trt | Time×Trt |
	D0	D10	D20	D41	D0	D10	D20	D41	D0	D10	D20	D41				
trans-10, *cis*-12 18:2	0.009a	0.012a	0.010a	0.010a	0.010a	0.010a	0.010a	0.009a	0.009a	0.010a	0.009a	0.010a	0.001	0.42	0.43	0.75
trans-11, *cis*-15 18:2	0.086c	0.058c	0.079c	0.062c	0.086c	0.059c	0.077c	0.075c	0.086c	0.212b	0.329a	0.313a	0.016	<0.01	<0.01	<0.01
cis-9, *trans*-11, *cis*-15 18:3	0.033cd	0.027d	0.034cd	0.026d	0.035cd	0.024d	0.036cd	0.025d	0.035cd	0.047bc	0.064a	0.056ab	0.004	<0.01	<0.01	<0.01
cis-6, *cis*-9, *cis*-12 18:3	0.021a	0.026a	0.029a	0.027a	0.025a	0.025a	0.031a	0.028a	0.026a	0.026a	0.026a	0.022a	0.002	0.10	0.31	0.24
cis-9, *cis*-12, *cis*-15 18:3	0.640cde	0.543de	0.785bc	0.627cde	0.619cde	0.498e	0.697cd	0.622cde	0.629cde	0.881b	1.201a	1.178a	0.052	<0.01	<0.01	<0.01
cis-6, 9, 12, 15 18:4	0.017bc	0.017bc	0.016c	0.012c	0.015c	0.015c	0.016c	0.016c	0.016c	0.025ab	0.028a	0.025ab	0.002	0.05	<0.01	<0.01
19:0	0.062bcde	0.072bcd	0.078bc	0.038de	0.062bcde	0.056cde	0.074bc	0.036e	0.062bcde	0.143a	0.094b	0.069bcde	0.008	<0.01	<0.01	<0.01
20:0	0.106bcde	0.077ef	0.134ab	0.083def	0.100cdef	0.070f	0.127abc	0.088def	0.101bcdef	0.087def	0.145a	0.111bcd	0.007	<0.01	0.02	0.41
cis-9 20:1	0.006b	0.012ab	0.009b	0.007b	0.006b	0.008b	0.005b	0.008b	0.006b	0.020a	0.010b	0.011ab	0.003	<0.01	<0.01	0.07
cis-11 20:1	0.013a	0.021a	0.026a	0.017a	0.017a	0.017a	0.014a	0.017a	0.015a	0.018a	0.021a	0.030a	0.004	0.26	0.25	0.14
cis-11, *cis*-14 20:2	0.018a	0.020a	0.020a	0.018a	0.018a	0.017a	0.020a	0.016a	0.018a	0.018a	0.021a	0.018a	0.002	0.15	0.54	0.95
cis-11, *cis*-14, *cis*-17 20:3	0.010c	0.011bc	0.017ab	0.012abc	0.011bc	0.013abc	0.013abc	0.011bc	0.010c	0.013abc	0.018a	0.012abc	0.002	<0.01	0.20	0.24
cis-8, *cis*-11, *cis*-14 20:3	0.016ab	0.019ab	0.019ab	0.019ab	0.016ab	0.013b	0.021a	0.015ab	0.017ab	0.014ab	0.015ab	0.014ab	0.002	0.17	0.03	0.06
cis-8, 11, 14, 17 20:4	0.011a	0.015a	0.015a	0.016a	0.012a	0.012a	0.014a	0.015a	0.012a	0.015a	0.014a	0.015a	0.002	0.13	0.72	0.96
cis-5, 8, 11, 14 20:4	0.110ab	0.081bc	0.131a	0.078bc	0.108ab	0.070c	0.114ab	0.081bc	0.110ab	0.060c	0.094bc	0.069c	0.008	<0.01	0.04	0.29
cis-5, 8, 11, 14, 17 20:5	0.043de	0.039e	0.066abc	0.043de	0.042de	0.037e	0.060abcd	0.049bcde	0.047cde	0.041de	0.078a	0.068ab	0.004	<0.01	<0.01	0.06
22:0	0.041ab	0.024c	0.043a	0.026bc	0.037abc	0.024c	0.039abc	0.029abc	0.037abc	0.024c	0.044a	0.033abc	0.004	<0.01	0.70	0.77
cis-13 22:1	0.011ab	0.012ab	0.014ab	0.010b	0.010b	0.011ab	0.015a	0.010b	0.010b	0.012ab	0.013ab	0.010b	0.001	<0.01	0.91	0.86
cis-13, *cis*-16 22:2	0.010a	0.011a	0.013a	0.012a	0.010a	0.011a	0.010a	0.010a	0.010a	0.011a	0.013a	0.011a	0.001	0.06	0.08	0.44
cis-13, *cis*-16, *cis*-19 22:3	0.006bc	0.017a	0.009abc	0.012abc	0.007bc	0.010abc	0.009abc	0.009abc	0.004c	0.013ab	0.008abc	0.009abc	0.002	<0.01	0.24	0.38
cis-7, 10, 13, 16 22:4	0.010b	0.015ab	0.018a	0.015ab	0.010b	0.011ab	0.015ab	0.014ab	0.012ab	0.012ab	0.016ab	0.011b	0.002	<0.01	0.19	0.40

| Item, g/100 g fat | Treatment[1,2]/Time[3] | | | | | | | | | | | | SEM | *P*-value | | |
| | CONT | | | | PALM | | | | FLAX | | | | | Time | Trt | Time×Trt |
	D0	D10	D20	D41	D0	D10	D20	D41	D0	D10	D20	D41				
cis-7, 10, 13, 16, 19 22:5	0.058[abcd]	0.040[cd]	0.087[a]	0.052[bcd]	0.056[abcd]	0.038[cd]	0.065[abcd]	0.051[bcd]	0.060[abcd]	0.037[d]	0.077[ab]	0.070[abc]	0.008	<0.01	0.46	0.35
cis-4, 7, 10, 13, 16, 19 22:6	0.021[a]	0.020[a]	0.029[a]	0.021[a]	0.022[a]	0.018[a]	0.019[a]	0.017[a]	0.024[a]	0.018[a]	0.022[a]	0.025[a]	0.003	0.25	0.16	0.31
24:0	0.022[a]	0.019[a]	0.022[a]	0.020[a]	0.021[a]	0.017[a]	0.019[a]	0.020[a]	0.020[a]	0.019[a]	0.021[a]	0.022[a]	0.002	0.43	0.51	0.97
cis-9 24:1	0.010[a]	0.012[a]	0.011[a]	0.009[a]	0.011[a]	0.010[a]	0.010[a]	0.010[a]	0.010[a]	0.009[a]	0.010[a]	0.010[a]	0.001	0.83	0.68	0.61
Others	1.21[cd]	1.18[cd]	1.12[cd]	1.11[cd]	1.23[bc]	1.01[d]	1.01[d]	1.03[cd]	1.23[bc]	1.44[ab]	1.52[a]	1.53[a]	0.05	0.97	<0.01	<0.01
Glycerol	12.8[ab]	12.8[a]	12.6[bcd]	12.8[abc]	12.8[ab]	12.8[abc]	12.5[d]	12.6[cd]	12.8[ab]	12.7[abc]	12.5[d]	12.4[d]	0.05	<0.01	<0.01	0.02
Sum of fatty acids																
De novo synthesized[8]	31.7[a]	33.0[a]	30.0[abc]	32.9[a]	32.7[a]	30.1[abc]	26.6[d]	28.2[bcd]	32.2[a]	30.4[ab]	27.1[cd]	27.1[cd]	0.8	<0.01	<0.01	<0.01
Mixed origin[9]	25.0[d]	26.3[cd]	25.5[d]	28.0[bc]	25.1[d]	30.2[a]	29.0[ab]	30.8[a]	25.1[d]	21.6[e]	20.6[e]	22.3[e]	0.4	<0.01	<0.01	<0.01
Preformed[10]	25.3[def]	22.8[ef]	26.8[cde]	21.5[f]	24.4[def]	22.2[f]	27.2[cd]	23.8[def]	24.7[def]	30.5[bc]	35.1[a]	33.6[ab]	0.9	<0.01	<0.01	<0.01

[1]CONT: Unsupplemented control diet; PALM: Diet supplemented with palmitic acid; FLAX: Diet supplemented with extruded flaxseed.

[2]Within a row, means without a common superscript letter differ ($P \leq 0.05$).

[3]Goats were subjected to repeated sampling intervals on the last 4 d of the pretreatment period (referred to as D0; data used as covariates), as well as during the experimental period on days 7 to 10, 17 to 20, and 28 to 41 (referred to as D10, D20, and D41, respectively).

[4]Coelution with minor concentration of *trans*-10 16:1.

[5]Coelution with minor concentration of *cis*-10 16:1.

[6]Coelution with minor concentration of *cis*-10 18:1.

[7]Coelution with minor concentration of *trans*-7, *cis*-9 18:2.

[8]Sum of straight even-chain fatty acids from C6 to C14.

[9]16:0 + 16:1 *cis*-9.

[10]Sum of all fatty acids with a carbon chain length of 18 or more.