

Fatty acid composition of milk and fat from American Milking Devon cattle

Milk

Procedure- The samples were prepared according to the method of Chouinard (1999). Samples were analyzed according to the method of Snow (2010).

Results- The fatty acid composition of the 12 individual milk samples is present in Table 1 and shown in Figure 3.

Table 1: Fatty acid composition of individual samples

Sample	one	two	three	four	five	six	seven	eight	nine	ten	eleven	twelve
C4:0	3.81	2.98	3.78	4.16	3.75	3.34	3.82	4.10	3.99	4.10	2.66	3.85
C6:0	2.47	1.81	1.92	2.22	1.98	1.94	1.94	2.27	2.29	2.33	1.36	2.03
C8:0	1.44	1.00	0.95	1.20	1.01	1.08	0.96	1.15	1.18	1.23	0.67	1.02
C10:0	3.24	2.35	1.95	2.78	2.12	2.37	1.92	2.25	2.40	2.52	1.51	2.17
C12:0	3.70	3.04	2.22	2.92	2.38	2.87	2.18	2.64	2.81	2.84	1.99	2.60
C14:0	10.68	10.00	8.48	10.47	8.39	9.76	8.66	9.29	10.48	9.43	8.45	10.70
C15:0	1.48	1.41	1.77	1.32	1.47	1.28	1.61	1.45	1.64	1.53	1.56	1.39
C16:0	27.87	27.23	24.38	26.63	23.04	24.94	23.30	29.25	28.03	25.61	24.61	26.34
C16:1 n7	2.30	2.76	1.94	2.19	1.66	2.96	2.61	2.19	1.88	2.03	3.63	2.40
C18:0	9.88	8.35	12.02	10.95	11.72	8.66	10.23	9.13	9.29	10.57	7.23	8.88
C18:1 t7	2.29	3.03	4.37	1.41	5.37	1.57	4.50	3.63	3.90	2.88	3.26	2.49
C18:1 n9	18.61	21.10	21.78	20.26	21.96	26.30	23.20	20.14	19.55	22.36	27.37	24.16
C18:2 n6	1.22	1.38	1.24	1.18	1.51	1.48	1.37	1.09	0.95	1.11	1.55	1.20
C18:3 n3	1.24	1.37	1.46	1.17	1.61	1.34	1.47	1.38	1.11	1.39	1.61	1.27
CLA 9-11	1.06	2.12	1.91	0.72	2.54	1.29	2.68	1.98	2.06	1.57	2.89	1.62

The average fatty acid composition of Devon milk from the twelve samples in this analysis are compared to the average American milk in Table 2.

There is some variation in the milks, a little of which is in the measurement, but most likely comes from genetics and diet. Comparing the Devon milk to the average American milk, there are three interesting differences, TVA, CLA and the n6:n3 ratio. TVA (C18:1n7) is the precursor for CLA and is about 2X as high. This fatty acid has similar health properties to CLA. The CLA content (CLA 9-11) is about 3X as high. Also perhaps good for marketing. The last interesting difference is in the n6:n3 ratio. There is a growing consensus that Americans eat too much omega-6 fatty acid (C18:2n6 in the samples). In the Devon milk, there is more omega-3s (C18:3n3) which is a function of diet.

Table 2: Fatty acid composition of Reference vs Devon milks in percent

Fatty acids	Reference	Devon average
C4:0	4.15	3.69
C6:0	2.13	2.05
C8:0	1.19	1.07
C10:0	2.59	2.30
C12:0	2.87	2.68
C14:0	9.53	9.57
C14:1 n5	0.82	0.84
C15:0	0.89	1.49
C16:0	28.08	25.94
C16:1 n7	1.48	2.38
C18:0	11.68	9.74
C18:1 t7	1.58	3.22
C18:1 n9	23.58	22.23
C18:2 n6	3.19	1.27
C18:3 n3	0.38	1.37
CLA 9-11	0.55	1.87
Saturates	63.11	58.53
Monounsaturates	27.46	28.68
Polyunsaturates	4.12	4.51
N6:n3 ratio	8.4	0.93

Fat sample

Procedure- The fatty acids were prepared according to the method of O'Fallon ([2007](#)) and analyzed by the method of Snow ([2010](#)).

Results- The devon fat sample is compared to a reference sample in Table 3 and Figure 2. The same features are interesting here. I think the TVA (C18:1t7) level in the reference is way too high, but this was the only report on beef fat I could find. There is more CLA in the Devon fat, and a lower n6:n3 ratio, which is thought to be good.

Table 3: Fatty acid composition of Devon fat vs. reference

Fatty acids	Devon fat	Reference
C14:0	3.36	3.46
C14:1 c9	0.85	0.83
C16:0	29.73	26.07
C16:1 c9	5.48	3.36
C17:0	1.33	1.61
C18:0	14.31	12.56
C18:1t7	1.98	7.97
C18:1n9	35.71	36.15
C18:1n7	1.47	
C18:2n6	2.16	4.44
C20:0	0.11	0.25
C18:3 n3	1.63	0.23
C20:1n9	0.13	0.08
CLA 9-11	0.44	0.29
C20:4 n6	0.40	0.85
C20:5 n3	0.23	0.17
saturates	48.84	43.95
monounsaturates	45.49	48.31
polyunsaturates	4.86	5.98
n6:n3 ratio	2.64	8.31

References

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