Supporting Information

"Steroid Biomarkers Revisited – Improved Source Identification of Faecal Remains in Archaeological Soil Material"

S7 Table. Sterol, stanol, and stanone contents of herbivore faeces (own data and data from literature).

Steroid (trivial name)	**Sheep[1x]** (n=1)	**Sheep[2a]** (n=1)	**Sheep[3x]** (n=6)	**Horse[1x]** (n=6)	**Horse[2a]** (n=1)	**Horse[3x]** (n=6)	**Horse[4x]** (n=26)	**Donkey[3x]** (n=6)
				Δ^5-Sterols (µg g^{-1})				
Cholesterol	111 ±11‡	1754	327 ±88‡	39 ±9‡	52	16 ±2‡	1936 ±149‡	24 ±3‡
Stigmasterol	22 ±5	109	4 ±0.5	26 ±5	53	15 ±2	1340 ±100	15 ±2
β-Sitosterol	196 ±56	1506	22 ±3	218 ±48	505	59 ±8	nd	131 ±15
				5β-Stanols (µg g^{-1})				
Coprostanol	170 ±27	1917	336 ±58	43 ±6	88	90 ±13	2787 ±275	131 ±16
5β-Stigmastanol	246 ±69	2754	69 ±30	91 ±18	445	51 ±5	nd	83 ±10
				Epi-5β-stanols (µg g^{-1})				
Epicoprostanol	16 ±3	268	10 ±7	5 ±1	62	22 ±3	2129 ±203	12 ±1
Epi-5β-stigmastanol	67 ±13	1467	nd	0 ±0	303	nd	nd	nd
				5α-Stanols (µg g^{-1})				
5α-Cholestanol	49 ±6	888	42 ±12	25 ±5	56	32 ±2	1791 ±111	20 ±2
5α-Stigmastanol	135 ±28	2304	nd	50 ±9	295	nd	4932 ±403	nd
				Stanones (µg g^{-1})				
Coprostanone	17 ±2	nd	nd	7 ±2	nd	nd	nd	nd
Cholestanone	nd	nd	nd	nd	nd	nd	nd	nd
				Ratios				
No. I	0.79 ✓	0.71 ✓	0.89 ✓	0.66 **+/-**	0.73 ✓	0.78 ✓	0.73 ✓	0.88 ✓
No. II	0.70 **+/-**	0.65 **+/-**	-	0.65 **+/-**	0.72 ✓	-	-	-
No. III	0.78 ✓	0.68 **+/-**	0.89 ✓	0.63 **+/-**	0.61 **+/-**	0.73 ✓	0.61 **+/-**	0.86 ✓
No. IV	-	-	-	-	-	-	-	-
No. V	41% ✗ (31-53%)	41% ✗	83% ✗ (74-91%)	32% ✓ (25-40%)	17% ✓	64% ✗ (58-69%)	-	61% ✗ (55-67%)
No. VI	0.37 ✓ (0.2-0.6)	0.67 ✓	-	0.12 ✗ (0.1-0.2)	1.39 ✓	-	-	-

nd = not determined; † mean ±standard deviation; ‡ mean ±standard error

We only considered studies, in which steroid contents were presented and quantified (not considered: Bull et al., 1999; Evershed et al., 1997; Jardé et al., 2007; Standley et al., 2000)

Cited studies: 1: Leeming et al., 1996; 2: Gill et al., 2010; 3: Shah et al., 2007 (µg g^{-1} wet weight basis); 4: Tyagi et al., 2007;

3: Results from Shah et al. (2007) presented here but excluded from further discussion due to extremely small 5β-stigmastanol contents compared to all other studies

Diet of the studied animals: x = no information provided; a = grass + hay (+concentrates);

Ratios for a detection of faecal matter (and reference):

No. I: (coprostanol + epicoprostanol) / (5α-cholestanol + coprostanol + epicoprostanol) (Bull et al., 1999);
No. II: (5β-stigmastanol + epi-5β-stigmastanol) / (5α-stigmastanol + 5β-stigmastanol + epi-5β-stigmastanol) (modified from Bull et al., 1999);
No. III: coprostanol / (5α-cholestanol + coprostanol) (Grimalt et al., 1990);
No. IV: coprostanone / (cholestanone + coprostanone) (Grimalt et al., 1990)

Threshold values (Ratios No. I-IV):
>0.7 faecal input confirmed ✓; 0.3-0.7 faecal input can neither be confirmed nor excluded **+/-**; <0.3 faecal input should be excluded ✗

Ratios for a source identification of faecal matter:

No. V: coprostanol / (coprostanol + 5β-stigmastanol) x 100% (Leeming et al., 1997)
No. VI: epi-5β-stigmastanol / 5β-stigmastanol + epicoprostanol / coprostanol

Threshold values (Ratios No. V-VIII):
No. V: < 38% faeces of herbivores; > 73% human faeces
No. VI: > 1.2 horse faeces; < 0.8 no horse faeces

✓ source identification was possible; ✗ source identification was not possible.

Supporting Information

"Steroid Biomarkers Revisited – Improved Source Identification of Faecal Remains in Archaeological Soil Material"

S7 Table (continuation). Sterol, stanol, and stanone contents of herbivore faeces (own data and data from literature)

Steroid (trivial name)	Cow[5b] (n=1)	Cow[1x] (n=6)	Cow[2a] (n=1)	Cow[2b] (n=2)	Cow[3x] (n=6)	Cow[4x] (n=24)	Cow[6x] (n=1)	Cow[7b] (n=6)
			Δ^5-Sterols (µg g^{-1})					**Sterols (%)**
Cholesterol	262 ±88[†]	201 ±53[‡]	155	281 ±66[†]	90 ±54[‡]	3774 ±247[‡]	223 ±8[†]	8.5
Stigmasterol	53 ±21	21 ±7	35	33 ±23	2 ±0.3	490 ±20	66 ±3	4.5
β-Sitosterol	263 ±82	187 ±34	360	360 ±7	11 ±0.4	nd	196 ±8	8.5
			5β-Stanols (µg g^{-1})					**5β-Stanols (%)**
Coprostanol	252 ±80	213 ±72	132	274 ±15	72 ±38	3658 ±264	203 ±9	6
5β-Stigmastanol	1940 ±628	184 ±41	821	635 ±32	6 ±1	nd	nd	9
			Epi-5β-stanols (µg g^{-1})					**Epi-5β-stanols (%)**
Epicoprostanol	97 ±14	15 ±6	15	111 ±1	0.7 ±0.4	543 ±54	54 ±2	5
Epi-5β-stigmastanol	1110 ±223	0 ±0	380	747 ±30	nd	nd	nd	20
			5α-Stanols (µg g^{-1})					**5α-Stanols (%)**
5α-Cholestanol	106 ±23	69 ±24	57	113 ±16	9 ±5	1791 ±111	128 ±5	8.5
5α-Stigmastanol	1052 ±150	210 ±23	504	212 ±157	nd	1133 ±65	377 ±19	15
			Stanones (µg g^{-1})					**Stanones (%)**
Coprostanone	54 ±17	19 ±7	nd	nd	nd	nd	84 ±3	nd
Cholestanone	68 ±25	nd	nd	nd	nd	nd	nd	nd
				Ratios				
No. I	0.77 ✓	0.77 ✓	0.72 ✓	0.77 ✓	0.39 **+/-**	0.70 **+/-**	0.67 **+/-**	0.55 **+/-**
No. II	0.74 ✓	0.47 **+/-**	0.70 **+/-**	0.87 ✓	-	-	-	0.66 **+/-**
No. III	0.70 **+/-**	0.76 ✓	0.70 **+/-**	0.71 ✓	0.89 ✓	0.67 **+/-**	0.61 **+/-**	0.41 **+/-**
No. IV	0.44 **+/-**	-	-	-	-	-	-	-
No. V	11% (6-20%)	54% ✗ (39-67%)	14%	30% (28-32%)	92% ✗ (83-96%)	-	-	40% ✗
No. VI	0.96 ✗ (0.6-1.7)	0.07 ✓ (0.03-0.2)	0.58 ✓	1.58 ✗ (1.5-1.7)	-	-	-	3.1 ✗

nd = not determined; [†] mean ±standard deviation; [‡] mean ±standard error

We only considered studies, in which steroid contents were presented and quantified (not considered: Bull et al., 1999; Evershed et al., 1997; Jardé et al., 2007; Standley et al., 2000)

Cited studies: 1: Leeming et al., 1996; 2: Gill et al., 2010; 3: Shah et al., 2007 (µg g^{-1} wet weight basis); 4: Tyagi et al., 2007; 5: Red cattle (own data, composite sample of n=5); 6: Isobe et al., 2002; 7: Derrien et al., 2011 (only fresh faeces considered)

3: Results from Shah et al. (2007) presented here but excluded from further discussion due to extremely small 5β-stigmastanol contents compared to all other studies

Diet of the studied animals: x = no information provided; a = grass + hay (+ concentrates); b = silage (+ concentrates or + grass)

Ratios for a detection of faecal matter (and reference):

No. I: (coprostanol + epicoprostanol) / (5α-cholestanol + coprostanol + epicoprostanol) (Bull et al., 1999);
No. II: (5β-stigmastanol + epi-5β-stigmastanol) / (5α-stigmastanol + 5β-stigmastanol + epi-5β-stigmastanol) (modified from Bull et al., 1999);
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