

*Brief Communication*

DISTRIBUTION OF SOME MINERAL COMPONENTS  
IN THE FOETAL FLUID  
OF THE GOAT AT DIFFERENT STAGES OF PREGNANCY

Amniotic and allantoic fluid samples were collected at different stages of pregnancy in the goat (*Lyngset* 1971). After collection the samples were stored in a frozen state until processed.

The fluid samples were analysed with regard to the minerals Ca, P, Mg, Na, K, Fe, Zn and Cu. The metals were determined by atomic absorption analysis, after wet ashing of the fluids with sulphuric and nitric acid (5 g fluid and 0.25 ml H<sub>2</sub>SO<sub>4</sub>). Phosphorus was determined spectrophotometrically as phosphoammoniummolybdate after the same ashing procedure.

Parallel with this investigation analyses of the oestrogenic content in the same foetal fluid samples were undertaken (*Lyngset & Lunaas* 1972).

The results of the mineral analyses are given in Table 1. As the amount of fluid varied, there were not sufficient quantities available for analyses at all stages, leaving these stages with no results in the table.

The contents were higher in the allantoic fluid than in the amniotic fluid for all the minerals under survey with the exception of Na, which showed a reverse pattern. This has earlier been stated in sheep with respect to Na, K, Ca, Mg and P (*McDougall* 1949).

For the macrominerals (Ca, Mg, K, Na and P) the differences between the allantoic and amniotic fluid were statistically significant, as proved by analysis of variance. An equal significance could not be proved for the microminerals.

There is a relatively great fluctuation in the mineral content throughout the whole gestational period in both fluid compartments, but for the content of Ca, Mg and K there seems to be a marked increase in the allantoic fluid at approx. the 90th day of

Table 1. Foetal fluid contents of the elements Ca, Mg, K, Na, Fe, Zn, Cu and P in the goat.

Day of pregnancy	Ca		Mg		K		Na	
	p.p.m. (w/w)		p.p.m. (w/w)		p.p.m. (w/w)		p.p.m. (w/w)	
	all.	amn.	all.	amn.	all.	amn.	all.	amn.
26	25	—	8.4	—	240	—	1600	—
45	72	29	11	7.9	180	590	3300	3000
60	67	46	16	13	190	540	780	3300
60	13	24	32	8.8	360	550	2200	3800
75	32	20	23	9.5	320	420	1200	3000
75	38	23	32	9.0	240	290	2400	2700
90	160	22	100	6.7	330	150	750	1200
90	320	18	290	4.8	1300	150	630	1100
105	180	24	160	7.2	1400	120	920	1000
105	—	35	—	25	—	310	—	2300
105	160	99	260	87	180	220	670	2800
120	240	21	240	6.4	2200	160	770	730
121	45	40	150	18	2600	320	1500	3400
130	150	100	180	29	900	470	160	1900
140	47	31	160	30	950	270	200	1700
140	100	48	560	110	2300	600	150	1700
145	140	24	170	9.4	1600	200	100	1300
Mean	112	38	150	23.9	956	335	1083	2183
	P<0.001		0.001<P<0.01		0.001<P<0.01		0.001<P<0.01	

  

Day of pregnancy	Fe		Zn		Cu		P	
	p.p.m. (w/w)		p.p.m. (w/w)		p.p.m. (w/w)		p.p.m. (w/w)	
	all.	amn.	all.	amn.	all.	amn.	all.	amn.
26	1.4	—	0.25	—	0.13	—	—	—
45	7.7	0.28	0.28	0.33	0.17	0.13	21	22
60	6.1	<0.05	0.33	0.43	0.20	0.16	19	28
60	3.6	<0.05	0.40	—	0.30	0.08	67	20
75	6.3	0.45	0.49	0.24	0.28	0.10	42	14
75	0.25	0.85	0.05	0.37	0.13	0.07	18	26
90	7.9	0.10	0.30	—	<0.05	<0.05	40	12
90	0.38	<0.05	0.23	0.03	<0.05	<0.05	89	3.7
105	11	1.1	0.30	0.35	0.20	0.16	27	22
105	—	—	—	0.18	—	0.10	—	11
105	7.4	9.7	0.33	0.31	0.13	0.33	17	22
120	2.7	0.78	0.34	0.12	0.13	—	71	21
121	0.45	3.5	0.50	0.36	0.07	0.13	25	24
130	4.6	6.1	0.20	0.61	0.12	0.23	26	37
140	<0.05	1.1	0.63	0.05	<0.05	<0.05	15	6.1
140	0.30	0.95	0.16	0.15	0.07	—	38	32
145	<0.05	1.4	0.04	0.05	0.13	<0.05	34	66
Mean	3.76	1.76	0.30	0.26	0.14	0.11	36.6	22.9
	0.05<P<0.2		Not signif.		Not. signif.		0.01<P<0.05	

gestation. For Na there is a corresponding decrease in the content at the same stage. No such pattern is observed in the amniotic fluid.

As stated by *Mellor & Slater* (1971) the sampling technique could be of significance, but is considered to be negligible in the present work.

*Gustav N. Havre and Olav Lyngset*

The Department of Biochemistry, and  
The Division of Postgraduate and Continuing Education,  
Veterinary College of Norway, Oslo.

#### REFERENCES

- Lyngset, O.*: Studies on reproduction in the goat. VII. Pregnancy and the development of the foetus and the foetal accessories of the goat. *Acta vet. scand.* 1971, *12*, 185—201.
- Lyngset, O. & T. Lunaas*: Amniotic and allantoic fluid levels of oestrogens at different stages of development in the goat. *Acta vet. scand.* 1972, *13*, 269—271.
- McDougall, E. L.*: The composition of foetal fluids of sheep at different stages of gestation. *Biochem. J.* 1949, *45*, 397—400.
- Mellor, D. J. & J. S. Slater*: Daily changes in amniotic and allantoic fluid during the last three months of pregnancy in conscious, unstressed ewes, with catheters in their foetal fluid sacs. *J. Physiol. (Lond.)* 1971, *217*, 573—604.

(Received November 1, 1973).

Reprints may be requested from: G. N. Havre, Veterinary College of Norway, PO Box 8146, Oslo Dep., Oslo 1, Norway.