TP 060

DIRECT DETERMINATION OF METALS IN BOVINE SEMINAL PLASMA

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The bovine beef demand has increased all over the world. The small consume by the Brazilian population reflects the economic problems and the small efficiency of the cattle production. This efficiency depends on the reproductive efficiency, as fertility rate, the age of the calving and the calving intervals, and the animals growth rate. Food deficiency and wrong manipulation can produce loses in the animal production. The determination of total bovine seminal plasma constitution is important. It dilutes the spermatozoid in the reproduction act and has been substitute by synthetic solutions in the artificial insemination, to avoid preservation problems. The role of inorganic contents has to be considered. The essential trace elements as Zn, Cu, Ca, Fe, Mg and Se have been associated with the reproductive function, including spermatic quality. In Se-deficient animals, motility of the spermatozoa is very poor and the majority of sperm tails shows breakage near the middle section and neck regions. In the present work, bulls semen were collected in sterile polypropylene tubes by electroejaculation and centrifuged at 3000 rpm for 10 min. In order to investigate the possible relationships between trace and major elements concentration and the usual laboratory indices of sperm quality, as morphology, motility and number of sperm, seminal plasma were 5 times water diluted and the main minor and major elements were directly determined by inductively coupled plasma optical emission spectrometry (ICP-OES). Selenium, which is found in trace amounts, was assessed by graphite furnace atomic absorption spectrometry (GFAAS). The used techniques allowed direct quantification in the specimen matrix, thereby minimizing the need for extensive sample preparation steps. Mineral contents in seminal plasma related to reproduction parameters are shown in Table 1. Variations due to dietary, population and ages can be observed. The analyses described here are rapid and allow quantification in a simple dilution of the specimen.

Table 1 Results (mg l^{-1}) of bull seminal plasma direct determined

Bull	1. Canchim	2. Canchim	3. 5/8 Charoles	4. Canchim	5. Canchim
Age (months)	24	26	23	38	49
Ejaculated volume (ml)	8.0	10.0	8.0	7.5	9.0
Motility (%)	50	75	75	75	70
Vigor (0-5)	4	5	4	4	4
Concentration (x 10^6 /ml)	-	730	232	756	913
Total anomalies (%)	-	15.0	15.0	6.0	26.5
Al	0.3 ± 0.1	0.6 ± 0.1	0.8 ± 0.1	< LD	0.3 ± 0.1
B	17 ± 1	27 ± 1	32 ± 1	30 ± 1	23 ± 1
Ca	149 ± 1	155 ± 1	224 ± 1	188± 1	306± 1
Cu	0.02 ± 0.01	0.05 ± 0.01	0.14 ± 0.01	0.08 ± 0.01	0.19 ± 0.01
Fe	0.2 ± 0.1	0.5 ± 0.1	0.6± 0.1	0.3 ± 0.1	0.3± 0.1
Mg	55 ± 1	74 ± 1	76 ± 1	120 ± 1	151 ± 2
P	64 ± 1	413 ± 1	128 ± 1	716 ± 6	537 ± 1
S	93 ± 1	110 ± 1	331 ± 2	213 ± 2	306 ± 1
Zn	0.9 ± 0.1	4.2 ± 0.1	2.3 ± 0.1	3.6 ± 0.1	2.3 ± 0.1
Se	1.7 ± 0.1	1.8 ± 0.1	1.5 ± 0.1	2.8 ± 0.1	1.5 ± 0.1

Fapesp (98/10814-3); CNPq