



## Effects of macro and micronutrients on buffalo semen quality

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### Introduction

The quantity of minerals in the bull ejaculated is lower than in the organic tissues and it depends on nutritional elements offered in diets. In young males, macronutrients have an indirect effect on reproduction, while unbalance in micronutrient impairs spermatogenesis, reduces libido and, consequently, affects the fertility. Supplemental feeding strategies can increase productive performance, and effects of minerals offered in the diets can not be neglected (1). Therefore, this study evaluated the correlations between consumption of nutrients contained in concentrates, sperm motility and integrity of plasma membrane (IPM).

### Material and Methods

Fifteen adult buffalo bulls (*Bubalus bubalis*) were divided in three groups according to: (Control, n=5; Base-CM, n=5; Base-PKC, n=5). Buffaloes were maintained on grazing and daily supplemented with experimental rations during 252 days (1%Body Weight). Macro and micronutrients consumed quantities were calculated as a function of consumption of experimental rations (kg/DM) and mineral concentration in dry matter base. Macro (Ca, Na, Mg) and micronutrients (Co, Se, Fe, Mn, Cr, Cu, Mo, Zn) were measured according (2, 3) and the individual consumption was daily controlled. In order to assess nutrients effect on seminal quality, ejaculates were weekly evaluated (4). Pearson's correlations were calculated using SAS (P<0.05).

### Results and Discussion

Correlations between minerals offered and seminal features are demonstrated in Table 1. There was significant and positive correlation, medium intensity, between Ca, Mg, Na and sperm motility, explained by direct involvement of these elements in regulation of cellular energy production and nutrient transport, essential for spermatozoa reaching the *locus* of fertilization. Lower correlations between Ca, Mg and IPM were observed, although these elements play a role in maintenance of osmolarity and stability of biological membranes (5). Sperm motility and IPM presented positive correlation, medium intensity, with all micronutrients, surprisingly the lower with zinc. Certain elements, in adequate concentrations, act as antioxidants and cofactors in capacitation, acrosome reaction and oocyte penetration (6). There was higher intake of macro and micronutrients and significant improve in sperm motility and IPM in Base-PKC animals (data not showed), that becomes palm kernel cake an efficient alternative feedstuff for production and reproduction.

Table 1. Correlations between minerals consumption, progressive sperm motility and integrity of plasma membrane (IPM) in buffalo semen.

Semen Features	Macronutrients			Micronutrients							
	Ca	Mg	Na	Co	Se	Fe	Mn	Cr	Cu	Mo	Zn
Motility (%)	0.338	0.301	0.363	0.376	0.366	0.367	0.339	0.347	0.331	0.319	0.171
IPM (%)	0.244	0.174	0.343	-	0.331	0.329	0.348	0.326	0.219	-	-
P Value	*	*	*	*	*	*	*	*	*	*	**

\*P<0.0001; \*\*P<0.001

### References

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