



## **Polysaccharides Containing Arabinose and Galactose Decrease Oxidative Damage to Sperm In Vitro**

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Polysaccharides containing arabinose & galactose (PCAG), such as arabinogalactan, are abundant in plant gums. These PCAGs have a membrane stabilizing effect in a variety of cell types. Studies were done to determine the effects of PCAG on bull sperm during freezing and culture.

In Experiment 1, ejaculates from 4 bulls at a commercial AI stud were frozen in standard egg yolk buffer (EYB) or in egg yolk buffer with PCAG (PEYB). Six straws of sperm from each bull and treatment were thawed and: 1) held at 37° C for 10 min, then evaluated for membrane lipid peroxidation (TBARS assay) and sperm chromatin damage (Sperm Chromatin Structure Assay); or 2) cultured in routine TALP medium for 24h to determine sperm survival rates. Results: sperm frozen in EYB had more oxidative ( $p=0.03$ ) and chromatin ( $p=0.01$ ) damage after thawing than sperm in PEYB. Only 1 of 4 bulls had > 10% motile sperm at 24h of culture for sperm frozen in EYB; whereas 3 of 4 bulls had >10% motile sperm for sperm frozen in PEYB.

In Experiment 2, sperm from 5 bulls (4 straws each) frozen in standard EYB were thawed, washed and placed in TALP either w/or w/o PCAG for culture at 37° C. At 4h, sperm motility was determined and aliquots were removed to determine membrane lipid peroxidation.

### **Results**

More sperm were motile ( $p=0.04$ ) and had lower oxidative damage ( $p=0.01$ ) in TALP with added PCAG, than in TALP alone. Follow-up studies identified an active fraction of the PCAG between 20K and 100K which promoted sperm motility and membrane stability. Preliminary studies have shown decreased oxidative stress and chromatin damage for human sperm in culture with HTF including the PCAG.

### **Conclusion**

PCAG stabilizes sperm during assisted reproduction techniques. Specifically, they appear to decrease oxidative stress and chromatin damage.