

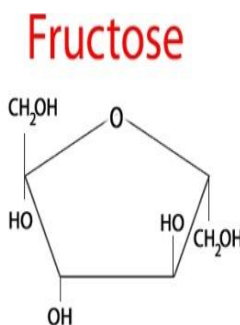
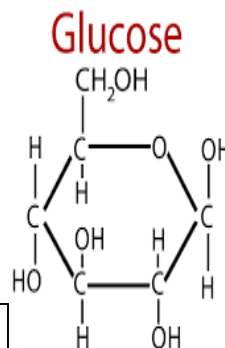


Effect of Monosaccharides supplementation on sperm characteristics of Barbari buck semen during long term preservation

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**Stored in
TEYC at
refrigerated
temperature**



Motility at 24 hr ↑

Viability, Membrane Integrity, Acrosomal integrity at 72 ↓

Motility at 24 hr ↓

Viability, Membrane Integrity, Acrosomal integrity at 72 ↑

- Globally most of the researcher use glucose as energy source in dilutor (Holt, 2011).
- Effect of Glucose/Fructose supplementation on storage of semen **at refrigerated temperature** is scantily available.
- No reference is available except in canine and bovine.
- Sugars act as energy source, cryoprotectant and maintains osmotic pressure (Purdy, 2006; Fernández et al. 2012).

- Experimental animals
- Semen collection
- **Initial assessment**
(Colour, consistency, volume, mass motility, Conc)
- Semen dilution - **Group I** (Tris, Egg yolk, Citric acid, Glucose) and **Group II** (Tris, Egg yolk, Citric acid, Fructose)
- **Seminal quality parameters**
(Progressive motility, viability, plasma membrane integrity, acrosomal integrity)

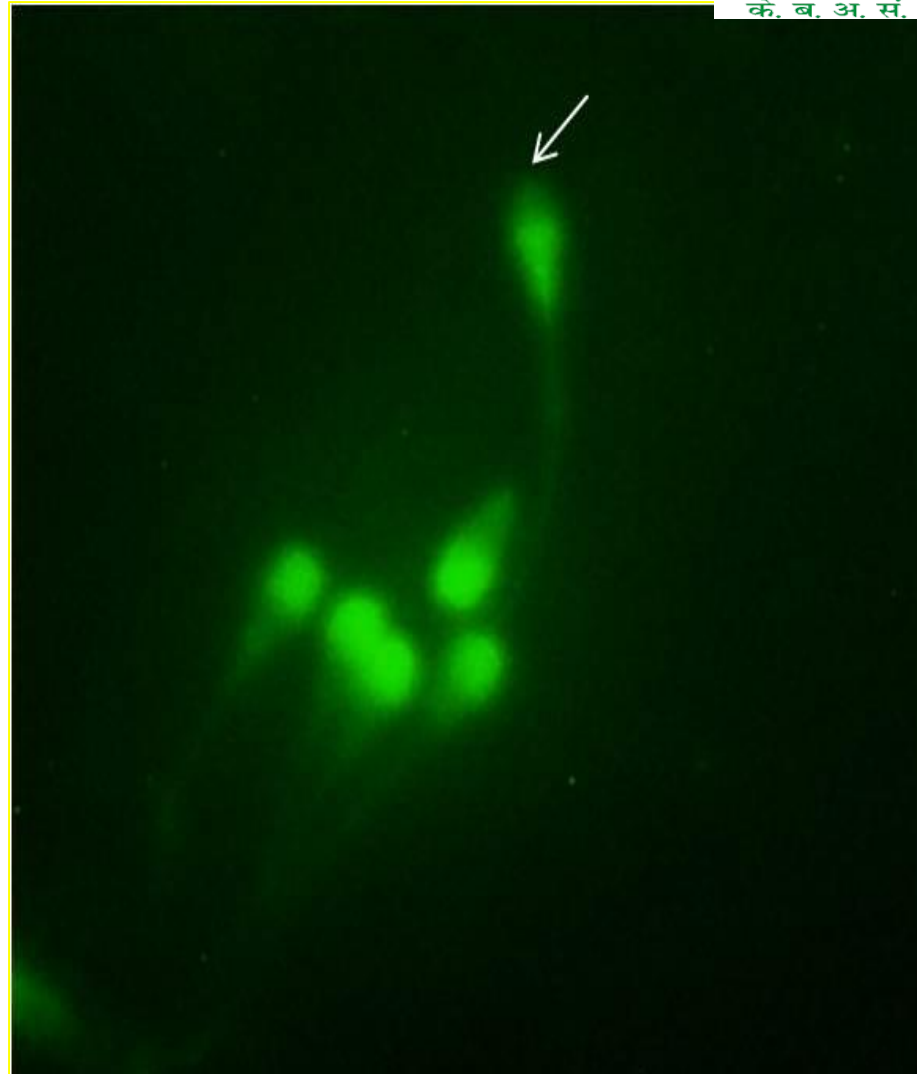
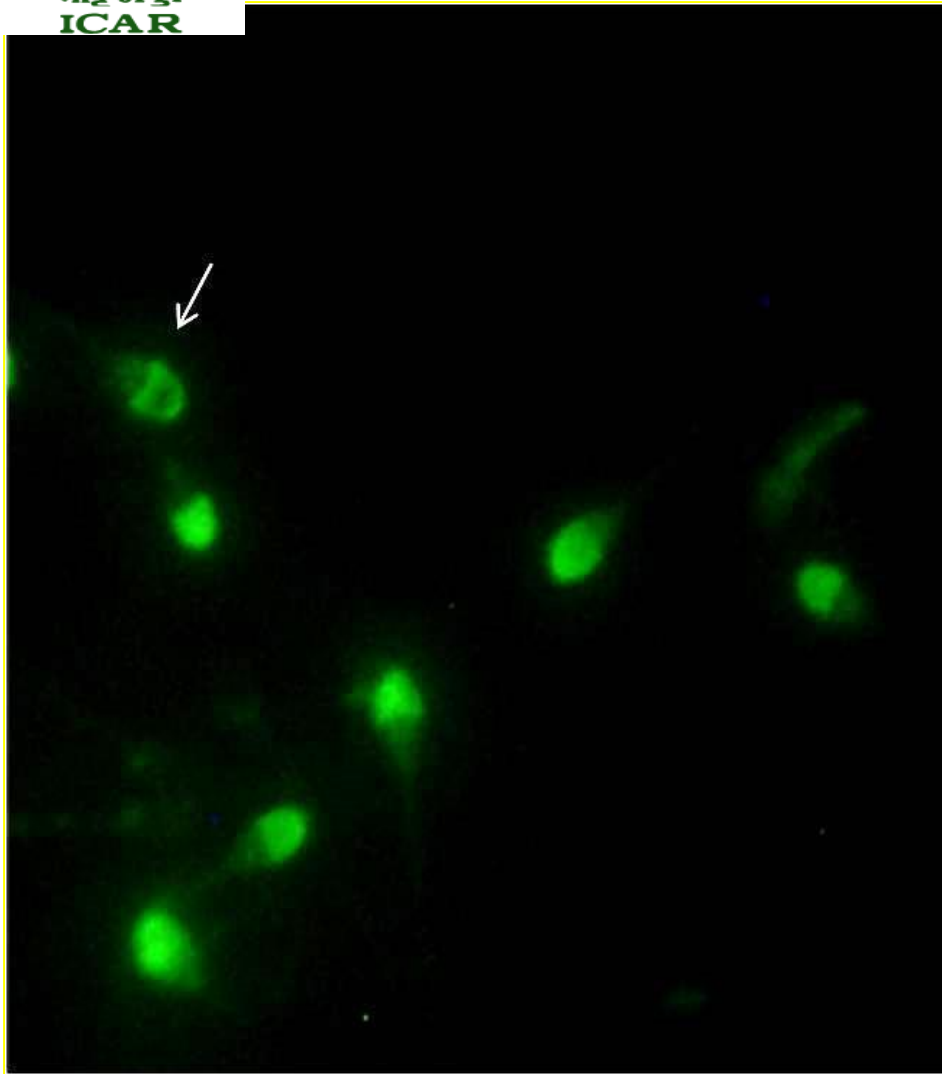
Photomicrograph showing live and dead spermatozoa in buck semen (Eosin-Nigrosin Stain, Magnification 100 X)



Photomicrograph showing hypo-osmotic swelling in buck semen (HOS solution 150 mosm Magnification 40 X)



Photomicrograph showing acrosomal integrity of spermatozoa in buck semen (FITC-PSA Stain) Magnification 40X



Seminal quality parameters at different time interval during refrigerated temperature (Mean \pm S.E.)

Time Interval	0 hr		24 hr		48 hr		72 hr	
	Glu	Fru	Glu	Fru	Glu	Fru	Glu	Fru
Motility	83.75 \pm 2.63	84.13 \pm 2.48	77.38 \pm 1.75 ^a	73.75 \pm 1.45 ^b	62.50 \pm 2.31	66.88 \pm 1.61	37.50 \pm 3.66 ^b	52.50 \pm 2.50 ^a
Viability	89.25 \pm 1.68	90.00 \pm 1.59	81.75 \pm 1.85	82.00 \pm 1.98	71.38 \pm 2.00	74.13 \pm 1.52	46.75 \pm 2.85 ^b	57.50 \pm 2.14 ^a

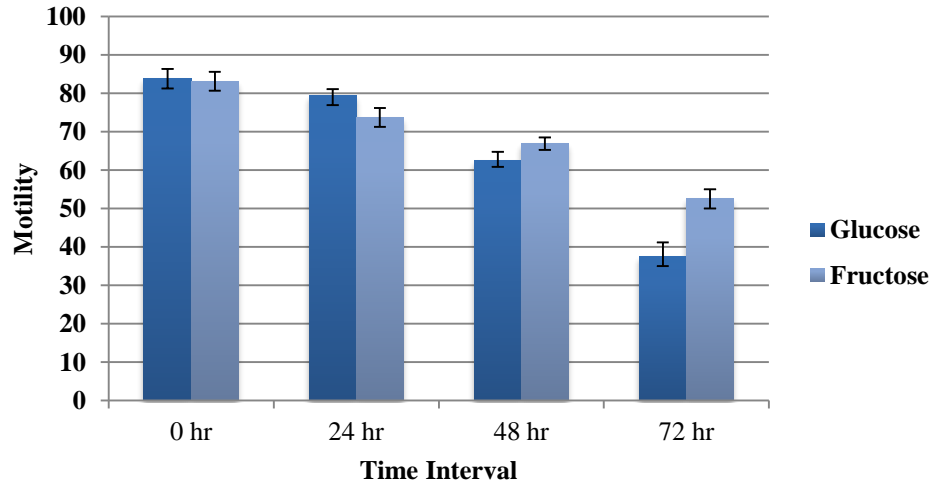


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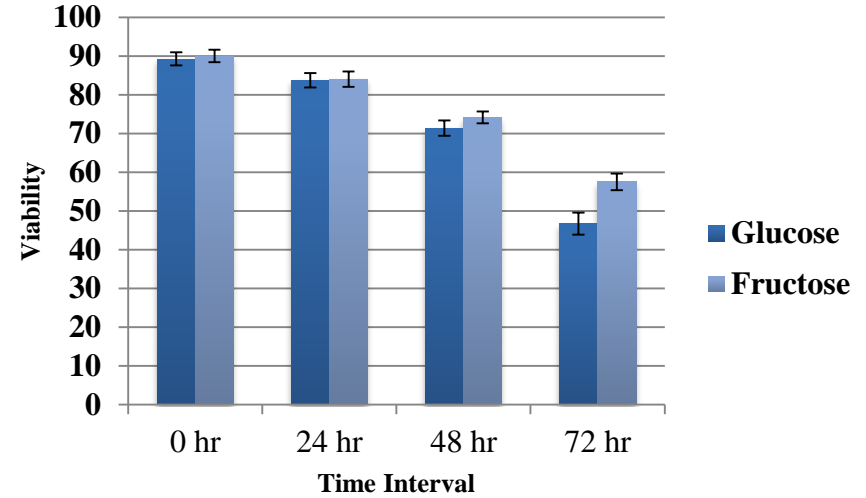
Time Interval	0 hr		24 hr		48 hr		72 hr	
	Glu	Fru	Glu	Fru	Glu	Fru	Glu	Fru
Parameters								
Plasma	78.50±	76.38 ±	73.38 ±	71.25 ±	60.50 ±	65.50 ±	41.00 ±	54.13 ±
membrane Integrity	1.35	1.29	1.42	1.16	1.29 ^b	1.21 ^a	2.63 ^b	1.98 ^a
Acrosomal Integrity	91.25±	91.38 ±	86.00 ±	85.50 ±	79.38 ±	79.13 ±	66.63 ±	72.13 ±
	0.99	1.13	1.16	1.19	1.32	1.23	1.36 ^b	0.91 ^a

Seminal Quality parameters in different time interval as expressed Mean \pm SE

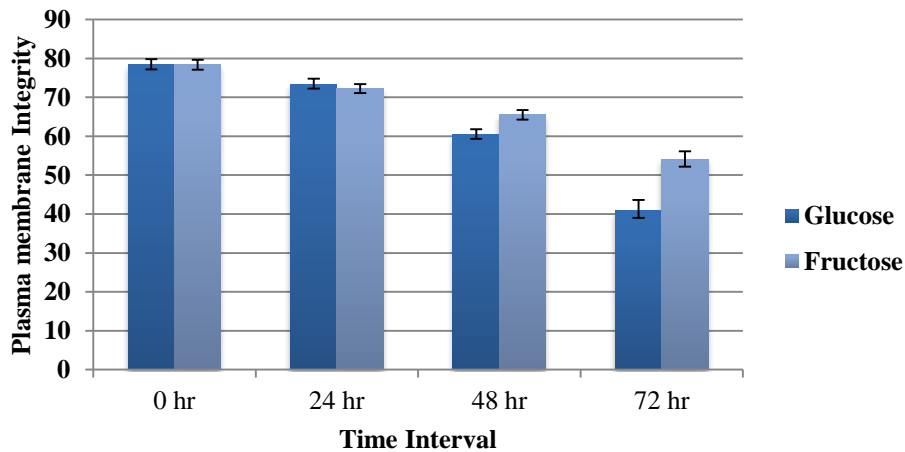
Sperm Motility



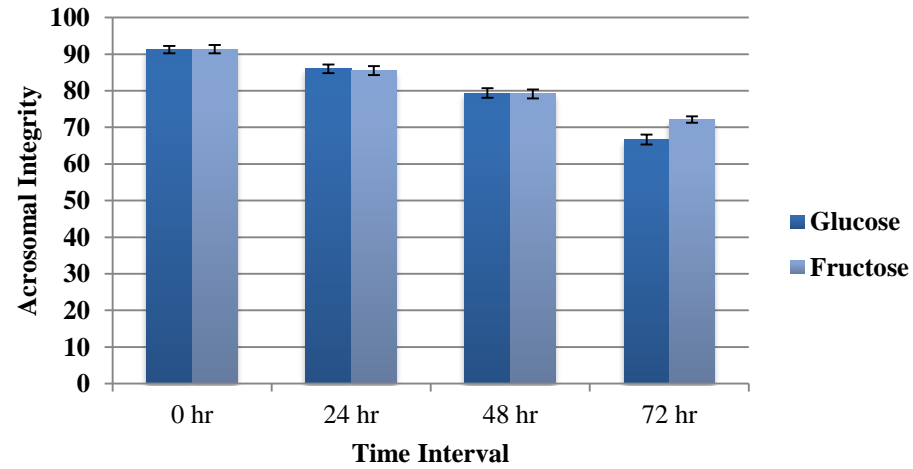
Sperm Viability



Plasma membrane Integrity



Acrosomal Integrity



- The **motility was significantly higher ($p < 0.05$)** at 24 hr in extender containing glucose as compared to extender containing fructose. However, the motility was decreased subsequently at 48hr and 72hr.
- Other parameters like viability, plasma membrane integrity and acrosomal integrity **decreased significantly ($p < 0.05$) at 72** hr in extender containing glucose when compared with that of fructose.

- Salisbury (1978) reported that species having **more fructose** in seminal plasma have **better freezability**.
- Epididymal sperm are **non motile** while ejaculated sperm are **motile**.
- Sperm having **more fructolysis index** have **more fertilizing ability**
- Glycolysis/fructolysis is the main source of energy in anaerobic respiration.

Discussion

- Windsor (1997) and Ponglowhapan et al. (2004) reported that EYT extender supplemented with **fructose is the best** among the tested extenders for long-term preservation of chilled canine semen.
- Contrary to this Corteel (1974) and Purdy (2006) found that **glucose is more suitable sugar**.
- Naing et al. (2010) reported that there was no significant difference in post motility in extender supplemented with glucose or fructose.
- Akhter et al. (2010) reported that **fructose is beneficial** for bovine semen preservation at refrigeration temperature.

- In field conditions, due to lack of proper facilities, semen stored at refrigerated temperature can be a potential tool for AI.
- **Fructose is more suitable sugar** for long term storage of buck semen at refrigerated temperature than glucose.

- The current study is very much **beneficial for the small farmers/goat keepers** who cannot afford to establish cryopreservation unit in developing countries.
- Artificial insemination with chilled semen can be way to faster genetic improvement with more promising results.

- Akhter S, Ansari MS, Rakha BA, Andrabi SMH, Anwar M, Ullah N. 2010. Effect of fructose addition in skim milk extender on the quality of liquid Nili-Ravi buffalo (*Bubalus bubalis*) semen. Pakistan J. Zool. 42(3): 227-231.
- Corteel JM. 1974. Viabilite' des spermatozoid de bouc conserves etcongele's avec ou sans leur plasma seminal: effect du glucose (viability of spermatozoa deep frozen with or without seminal plasma: glucose effect). Ann. Biol. Anim. Biochem. Biophys. 14: 741–745.
- Fernández JG, Izquierdo EG, Tomásb C, Mocéb E, Mercadoa E. 2012. Effect of different monosaccharides and disaccharides on boar sperm quality after cryopreservation. Anim. Reprod. Sci. 133: 109– 116.
- Naing SW, Wahid H, MohdAzam K, Rosnina Y, Zuki A.B, Kazhal S, Bukar MM, Thein M, Kyaw T, San M.M. 2010. Effect of sugars on characteristics of Boer goat semen after cryopreservation. Anim. Reprod. Sci. 122: 23–28.
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Thank you

