



Sperm Metabolism

Sperm metabolism

Energy metabolism is the means by which spermatozoa convert (meta) substance into usable forms of energy. Enzymes for this conversation are (into) in the mitochondrial sheath.

Adenosine triphosphate (ATP), a high energy compound, is the form of energy that can be used by spermatozoa. Its converted to ADP yielding 7.000 Calories per mole of energy by following reaction.

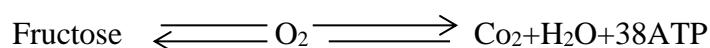


The metabolism of sperms are two types:

The metabolism of sperm are two types:

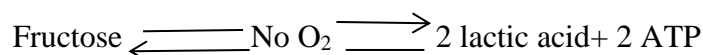
1. aerobic metabolism
2. anaerobic metabolism

1.Aerobic metabolism:



The energy from 38ATP is 266.000 calories

2.Anaerobic metabolism



Anaerobi metabolism produce 14.000 calries. This reaction provide energy to maintain the viability of spermatozoa during storage(epididymis).

Factors affecting rate of metabolism:

A number of factors contribute and affect metabolism rate of sperm. Reduce metabolic rate leads to extended life of spermatozoa in the epididymis. In the epididymis, spermatozoa may remain fertile for up 60 days. However spermatozoa in fresh ejaculated semen will be fertile only for afew hours in steps are not taken to reduce their metabolism rate.



The factors are:

1- Temperature:

Metabolic rate increase and life span of spermatozoa decrease as the temperature of semen rises.

2- PH:

A PH are about (6.6-6.9) up 7.5. high metabolic rate if PH of semen deviates toward alkalinity or acidity or may be metabolic rate will be reduced. High variation of PH from its values may be toxic for the spermatozoa.

3-Osmotic pressure:

Either hypotonic or hypertonic diluters will reduce metabolic rate

4-concentration of sperm:

Increasing the concentration of spermatozoa that above normal ejaculate will decrease metabolic rate

5-Gases:

Low concentration of carbon dioxide stimulate aerobic metabolism of spermatozoa. If the partial pressure of carbon dioxide exceed 5-10% metabolic rate is depressed, in other hand too high level of oxygen is toxic and will depress metabolism rate.

6-Light:

The harmful effect is observed only if the semen is in contact with oxygen. The enzyme catalase will prevent the harmful effect of light, which suggest that the light causes a photochemical reaction of the semen, that result in production of hydrogen peroxide. Semen should be protected from light and never exposed to direct sun light.

7-Antibacterial Agents:

Gentamicin, tylosin, linkospectin, penicillin are added to semen during storage, are added to semen during storage, which leads to depletion of life of sperm by elimination of bacterial growth.

