EXERCISE NO. 16

Different equipments used in artificial insemination

Learning objectives

To know about the equipments used in artificial insemination

Introduction

Knowledge about different equipments used in artificial insemination of cow and buffaloes is important for successful AI. It is necessary to store all the insemination equipment in a clean plastic or stainless steel box. Keep this box closed when it is not being used. Clean all equipment before returning it to the box. Always maintain sterility of the plastic sheaths used to cover the straw gun.

Equipment used in A.I.

1. Liquid nitrogen container (s) with frozen semen.
2. Dip stick for measuring the level of liquid nitrogen.
3. A.I. gun appropriate to the type of frozen semen straw (medium/ mini)
4. Plastic sheaths in sufficient number appropriate to the type of frozen semen straw in intact polythene bag.
5. Semen straw holding forceps.
6. Thawing box.
7. Clean absorbent cotton/ clean cloth for absorbing moisture from thawed semen straw.
8. Clean and sharp scissors for cutting the sealed end of the straw.
9. A clean and hygienic tray for carrying A.I. gun, sheaths, scissors and straw holding forceps etc.
10. Soap and clean towel
11. Centigrade thermometer for checking temperature of the taw bath.
12. Enamelled jug and bucket for water.
13. Register/Cards for record regarding artificial insemination done

Liquid nitrogen container, its construction and precautions in handling

Liquid nitrogen container is double layered vessel. The inner chamber is suspended in the outer chamber through neck tube which is non-metal and a bad conductor of heat. This structure (neck tube)prevents transfer of heat from outside to the inner chamber and thus rapid evaporation of the liquid nitrogen is prevented. The neck tube is a weaker structure compared to metallic parts. Sudden moves and jerks vibrate the inner chamber. Thus side to side movement of the inner chamber must considerable stress on the neck tube which is non-metal and delicate and very often leads to mechanical damage. The wall of the inner chamber is coated with high quality insulating material is also filled in between the outer and inner chambers. Vacuum is created in between the inner and theouter chambers. In the absence of the vacuum the liquid nitrogen would boil and there would be rapid loss of liquid nitrogen from the inner chamber. A highly visible frost at the top of the liquid nitrogen container is indicative of rapid evaporation of the liquid nitrogen.

Precautions

1. Liquid nitrogen should be kept in a cold place. Exposure to direct sun light and hot air should be avoided.
2. The room for storing liquid nitrogen containers (filled with liquid nitrogen) should be well ventilated.
3. Avoid direct contact of liquid nitrogen containers with hard floor. Use rubber/jute mats.
4. Avoid moisture on floor.
5. Avoid injuries, drilling, puncturing and scrapping.
6. Do not play with vacuum knob.
7. Never roll the liquid nitrogen containers.
8. Use trolley in the transportation of the liquid nitrogen containers.
9. Do not put liquid nitrogen container one over other.
10. Fill the liquid nitrogen slowly
11. Make regular checks of the liquid nitrogen in the container.
12. Do not put undesired material in the liquid nitrogen containers.

Dip stick for measuring the level of liquid nitrogen in the container

Checks regarding the level of liquid nitrogen in the cryocan are made by dipping a ruler in the cryocan. The dip stick should strike the bottom of the cryocan and should remain in the tank for about 10 seconds. Once the dip stick is removed from the liquid nitrogen container and is waved in air, frost is formed on it, in just few seconds. The frost indicates the level of the liquid nitrogen in the liquid nitrogen container. Black coloured dip stick is preferred, since it provides a good contrast between white frost and black coloured dip stick.

Precaution

1. Unnecessary and frequent measuring of the liquid nitrogen level should be avoided. It leads to unnecessary evaporation of liquid nitrogen.
2. Dip stick should not be kept loose, otherwise it may break. It should be hanged through wall.

A.I. Gun

The A.I. gun should match the straw of frozen semen and should always be kept clean and hygienic.

Precaution

1. Care should be taken to avoid bending of A.I. gun and piston wire.
2. It should be clean and hygienic.
3. For further protection, A.I. gun may be kept in plastic/perpex container.

Plastic sheaths

Plastic sheaths should match the A.I. gun and the semen straw and should never be kept loose. The sheaths should always remain in a polythene packet. The packet of the sheaths should be given a small cut towards the side of the broad end of the sheaths to take out sheaths for use.

Calculation & Inference: **Date:**

Signature of the Teacher