

## Care of Newborn Calf And It's Management

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### Introduction

A new born experiences a sudden change at birth from a highly nourishing environment of the uterus to a stressful free-living environment that requires great adaptability and steadiness. In domestic species such as cattle, during the latter part of gestation, the foetus undergoes several maturational changes, controlled by the hormones that are responsible for the initiation of parturition and prepares the foetus for the free-living state.

Unfortunately, there is high mortality of the foetus during birth and within the first few days after birth. Many important events occur during these initial stages of birth and neonatal stage of the calf. Thus care of the calf during this period is important to enhance its survival.

### Initiation of spontaneous respiration

In eutocia (natural parturition) spontaneous respiratory movements are observed within 60 seconds of expulsion; during dystocia respiratory movements can sometimes occur before the offspring has been completely expelled leading to life-threatening condition to the foetus. During the birth process,  $pO_2$ , and blood pH fall and  $pCO_2$ , rise with the initiation of placental separation and occlusion of the umbilicus, thus restricting gaseous exchange.

Tactile and thermal stimuli at the level of the face of the foetus, simultaneously licking and nuzzling of the foetal body by the mother is also an important factor to stimulate the respiratory movements.

With the initiation of respiration lung inflation, the pulmonary vascular bed opens up followed by a sudden increase in pulmonary blood flow. These changes in vascular dynamics result in the rapid closure of the ductus arteriosus and foramen ovale followed by the ductus venosus. Thereby changing the process of gaseous exchange from the placenta, now it occurs via the lungs. Pulmonary surfactant, produced by type 2 pneumocytes during the maturation of the foetus at the end of gestation, assists in the initial lung expansion and alveolar stabilization.

With the birth of offspring, it is important to ensure that the nostrils, mouth and upper airways are cleared of fluid, mucus and attached foetal membrane. This can be aided with the use of fingers or with the use of a suction device. Simultaneously the elevation of the rear of the calf, via suspension from the hind limbs, can aid in clearing out of the fluid.

Quick rubbing of the chest with clean straw or towels act as a tactile stimulus for respiration, avoid vigorous compression of the chest as it can sometimes cause injury to the ribs and the thoracic organs. In critical cases use of portable oxygen cylinder and resuscitator equipment can be used to provide positive pressure ventilation. Where availability of such equipment is not possible, blowing of air into the mouth of the foetal can be practised. Simultaneously administration of respiratory stimulants example coramine and adrenaline under the supervision of a veterinarian can be practised.

### **Acidosis**

The origin of the metabolic acidosis is primarily due to the production of lactic acid by tissues. At birth the foetus usually has a mild metabolic and respiratory acidosis; metabolic acidosis usually corrected within hours of birth, whereas respiratory acidosis lasts up to 48 hours. Death of foetus during dystocia is likely due to severe respiratory and metabolic acidosis. Severe acidosis has an adverse effect on respiratory and cardiac function. It also reduces vigour and the suckling in the calf, causing impaired passive immunity due to low colostrum intake. For a farmer, its degree of acidosis can be monitored by determining the time to the calf attain sternal recumbency. A good muscle tone and a strong pedal reflex indicate a well-oxygenated calf with fairly normal acid-base status. Scleral and conjunctival haemorrhages represent hypoxia and acidosis and indicate a poor prognosis.

The metabolic acidosis can be treated with sodium bicarbonate at the dose rate of 1-2 mmol/kg as bolus intravenous injection of 50-100 ml (35 g in 400 ml of lukewarm water) can be administered safely. Simultaneously it is important that the calf has normal respiration to maintain the blood acid-base balance. The treatment of acidosis should be carried out after the expert opinion of a veterinarian.

### **Injuries at birth**

So, care must be taken at the time of birth, in condition where dam or foetal health is compromised and delay in parturition is observed, the local veterinarian must be summoned to aid in safe birth of a calf. Manipulative obstetrical procedures, especially forced traction, can result in injury to the new born calf. In case of injury to the calf or dam, the antiseptic dressing must be done hygienically to avoid infection at the site of injury.

### **Thermoregulation of new born**

After parturition, the new born calf must adjust to the temperature of the external environment that fluctuate widely and also usually below the uterine temperature.

Immediately after birth, the body temperature falls quickly before it eventually recovers. To support survival in the external environment, the metabolic rate increases, up to three times its foetal stage. This is under the availability of glycogen and adipose tissue reserves. In cases where these reserves are low, it may lead to hypothermia and death. Thermoregulation is also maintained by reducing heat loss, because of little subcutaneous fat and poor insulation the body temperature drops rapidly, as after birth the body surface is wet and extensive heat loss occurs due to evaporation.

Thermoregulation in the new born can be improved in some ways:

- With immediate food intake (colostrum) shortly after birth.
- Plan the birth to occur such that it falls in months with a thermally neutral environment.
- Reduce heat loss by ensuring by quickly drying the coat. Simultaneously, a comfortable area must be provided for good insulation from the external environment.

### **Management of umbilicus**

- It usually ruptures passively at birth. It is better to arrange birth in a clean environment with adequate hygiene and avoid handling of the umbilicus.
- To prevent the outbreak of 'navel ill' dip the navel (a simple smearing will not serve the purpose) in 7% or higher tincture of iodine solution and repeat after 12 hours (Do not use teat dip or weaker iodine solutions).
- A poorly maintained navel is the gateway to serious infections and application of antibiotic spray and dressing of the umbilicus.

### **Nutritional deficiencies and infectious agents**

Perinatal death of calves born with deficiencies of selenium, iodine and other trace elements result in high neonatal mortality rate. The infection must be monitored as these agents may cause not only pregnancy failure but also stillbirth and weakly offspring.

### **Protection from a furious dam**

Occasionally the dam, first-calf heifers tend to attack the new born calf, in this case is important to provide some physical protection to the calf and use of tranquillizer drug may be opted with the consultation from the veterinarian.