**Fetal membranes and fetal fluids**

The placenta is the fusion of the fetal membranes with the maternal endometrium and this process called placentation .

• The growing embryo get its nutrition from the mother through the placenta via the umbilical cord (umbilical cord consist from two vein one artery and urechus, the urechus transport the urine from the kidney to the allantois cavity and the artery carried the nonoxygenate blood from the fetus to mother while the vein carried the oxygenate one)

• Although the placenta serves as an interface for fetal and maternal blood and the exchange of nutrients, gasses and water.

• the blood of the fetus and mother never mix.

• the placenta act as a fetal digestive tract, lungs, kidneys and liver.

• Placenta act as endocrine organ by produced many hormone like progesterone , estrogen, eCG and relaxin etc.

**Fetal membranes and fetal fluid**

1- **Yolk sac** :- its primitive structure developing early in the embryonic period from the endoderm and disappearing after a short period of time in ruminants and swine but persisting for 4-6 weeks in mare before becoming a remnant in the F.M. Prior to formation of amnion ,the yolk sac perform limited placental function of providing nutrients and care of wastes for early embryo.

2- **Amnion** :- its formed about 13-16 days after conception in the mare ,sheep and cow from the ectoderm as a double walled sac that completely surrounds the fetus except at the umbilical ring .

Then inner layer of this double walled sac is the **true amnion** and the outer layer is the **false amnion**.

Until allantois is formed, the outer layer of amnion fuse with the chorion to form amniochorion which acts for very short period as did the yolk sac ,in providing for the transfer of nutrients and for care of waste for the embryo.

When amniotic sac is completed its filled with fluid called amniotic fluid and this fluid are clear, colorless and mucoid in nature .

Amniotic fluid. is present toward the end of gestation in amount of 2-8 litters in cattle. Amniotic fluids contains protein, fat ,fructose and salt.

The source of amniotic fluid in early to mid gestation is probably from amniotic epithelium and fetal urine as the fluid is quite watery, as gestation advanced the fluid become viscid because the bladder sphincter prevent the further release of urine into the amniotic cavity ,the probably source of mucoid amniotic fluid is then the saliva and secretion of the nasopharynx of the fetus . The volume of fluid are probably regulate d by the swallowing by the fetus.

**Functions of amniotic fluids**

a- Suspend the embryo and thus is a mechanical protection to the fetus.

b- Prevent adhesion between the soft developed tissue of the embryo and surround membrane.

c- Its considers bactericidal.

d- Assist in parturition because its slippery .mucoid consistency lubricates the fetus and birth canal.

Amniotic plaques :- are small irregular shaped ,flat ,white ,elevated epithelial thickening s present in the inner surface of the bovine amnion.

They are most noticeable of these structure is not known.

3- Allntois:- its double sac arises the second and third week of gestation in bovine from the endoderm. The inner layer fuses with the amnion to give rise to the allantoamnion . the outer layer fuses with the chorion to form the vascular allantochorion which eventually surrounds the allantoamnion is separated from it by the allantoic fluid.

Allantoic fluid : its formed from the waste product of the kidney which pass to it from the bladder through the umbilical cord by means of the urechus.

This fluid is clear ,watery and amber in color and contain albumin, fructose and urea. The volume of it toward the end of gestation varies from 4-15 l. in cow and 8-18 L in mare .

**Hippomanes** :- Amorphous ,semisolid ,amber –colored, soft pliable, rubber –like, irregular shaped masses or bodies 0.3-3.8 cm in diameter, found in the allantoic cavity, floating in the allantoic fluid of cow, mare and ewe.

This structure consist from cell debris, protein .mineral mainly calciumand phosphate.

4- Chorion :- it is the outer part of fetal membrane which is fused with outer layer of the allantois to form the chorioallantois.

This structure are richly supplied with blood vessels communicating with fetus and intimate contact with the endometrial. Its designed to carry on the metabolic interchanges of gases, nutrients and wastes between the fetal and maternal circulates.

In cow and sheep the chorioallantois is attached to the amnion at various point, this divided the allantoic cavity into a number of compartments.

In dog cat and mare there is no attached between them and the amnion containing the fetus floats free in the allantoic cavity attached only by the umbilical stalk . In this later animals the young are more apt to be born covered by the amnion or portion of it , unless it is promptly removed, they will smother if it lies over the nostrils and mouth .

