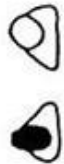
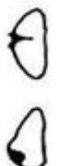
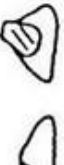



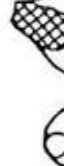




Fig.42 The changes of reproductive tracts in normal estrus cycle

Estrus Stage	Day 0	2	4	6-7	9-10
Ovary					
Uterus					
Size	1.5 - 2.5	1.5 - 2.5	1.5 - 2.0	1.5 - 2.0	1.5 - 2.0
Shape	Circle - Semi Circle	Circle - Semi Circle	Circle - Semi Circle	Circle - Semi Circle	Circle - Semi Circle
Contraction	++ - ##	+ - #	+	+	+
Thickness	++ - ##	+ - #	+	+	+
Inner Feeling	-	-	-	-	-
Cervix	Swelled, Open	Open	Closed	Tightly Closed	Tightly Closed
Vagina	Congested, Glossy	Mucous, Bleeding	Dried Mucosa	Dried Mucosa	Little Wet
Vulva	Swelled, Deep Wrinkle	Deep Wrinkle	Shrivel, Small Wrinkle	Small Wrinkle, Shriveld	Small Wrinkle, Shriveld
	12-14	16-17	19-20	21 (0)	
Ovary					
Uterus					
Size	1.5 - 2.0	1.5 - 2.0	1.5 - 2.5	1.5 - 2.5	
Shape	Circle - Semi Circle	Circle - Semi Circle	Circle - Semi Circle	Circle - Semi Circle	
Contraction	+	+ - #	+ - #	# - ##	
Thickness	+	+ - #	+ - #	# - ##	
Inner Feeling	-	-	-	-	
Cervix	Tightly Closed	Little Swelled	Swelled, Open	Swelled, Open	
Vagina	Dried	Dried	Congested, Clear Mucous	Congested, Glossy	
Vulva	Small Wrinkle, Shriveld	Deep Wrinkle	Swelled, Deep Wrinkle	Swelled, Deep Wrinkle	

6. Pregnancy Diagnosis

6-1 Anatomy of Pregnancy

After the fertilization, the embryo will enter to the uterus from the oviduct (Day5).

After the development (Ref. to Fig. 16), at Day9-10 the blasocyst will hatch as Fig.43.

Fig.43 Hatching Blastocyst

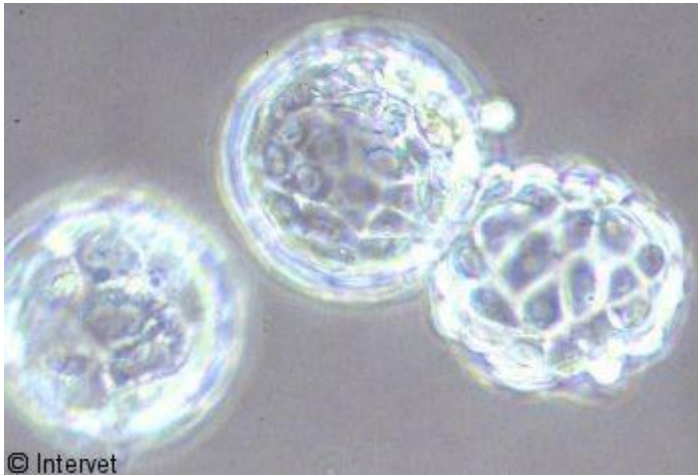
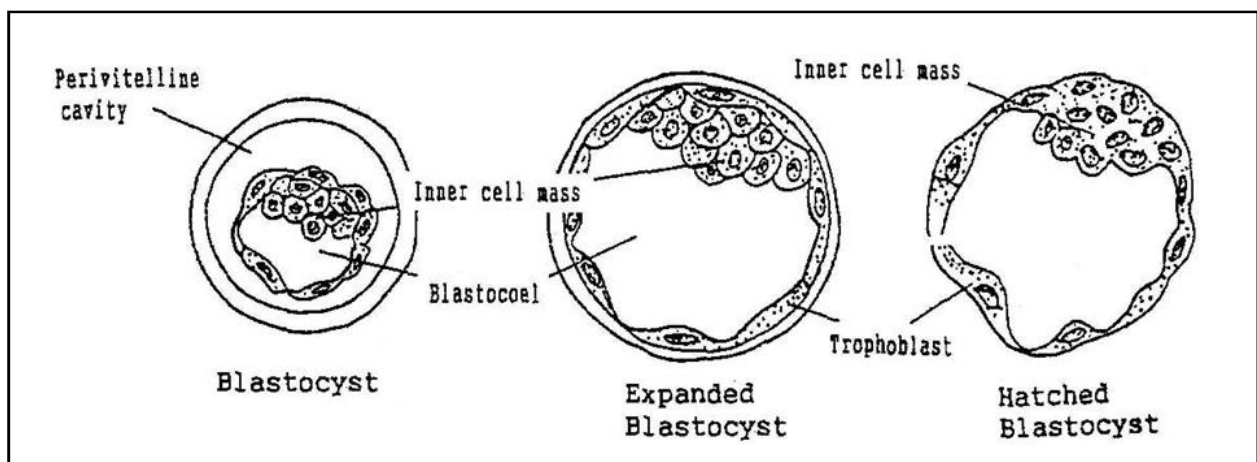


Fig. 44 Anatomy of Embryo



In blastocyst stage, the differentiation of the embryonic cells has already started. The Inner Cell Mass will become fetus, and the Trophoblast will be placenta. After the hatching the embryo will have a longer shape (elongation), and at about Day30 the implantation will occur. However the formation of placenta will start about Day40. After the implantation the amnion is formed around the fetus, then the fetus is protected by the double bags.

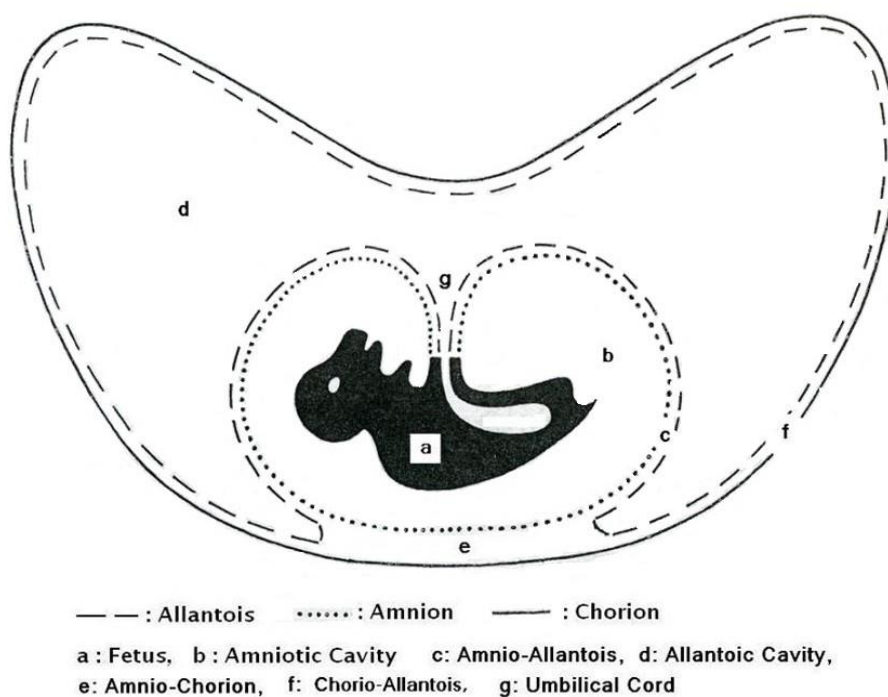
Fig. 45 (Elongated embryo: Day 14)

Day 30 Fetus

Placenta not yet formed.



Fig. 46 Anatomy of the Fetus



The structure and type of the placenta is different among animal species as follows

Type of Placenta	Animal
Diffuse, epitheliochorial	Horses and pigs
Cotyledonary, epitheliochorial	Ruminants (cattle, sheep, goats, deer)
Zonary, endotheliochorial	Carnivores (dog, cat, ferret)

Discoid, hemochorial

Humans, apes, monkeys and rodents

Fig. 47 Different btypes of Placenta

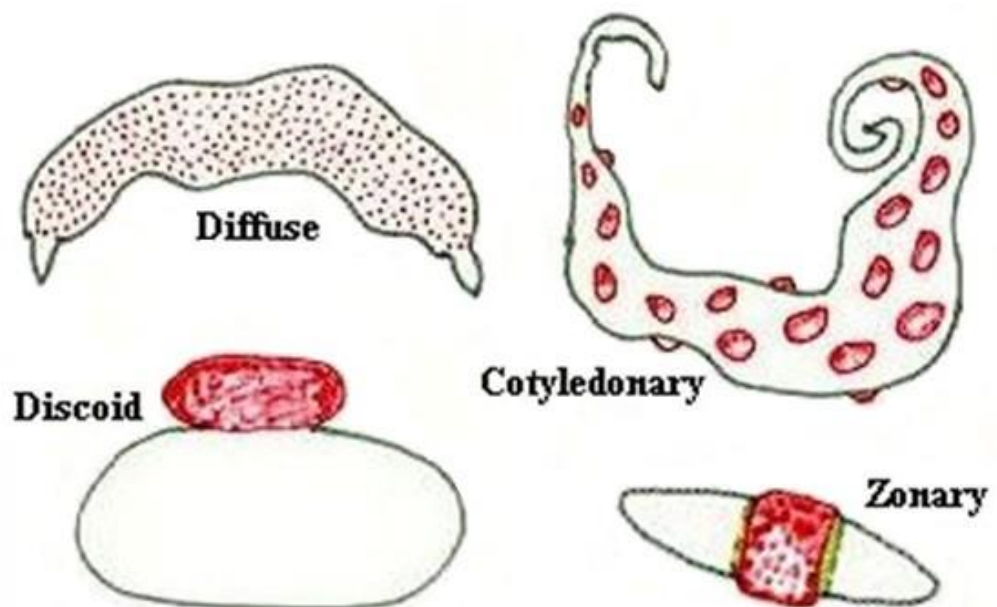
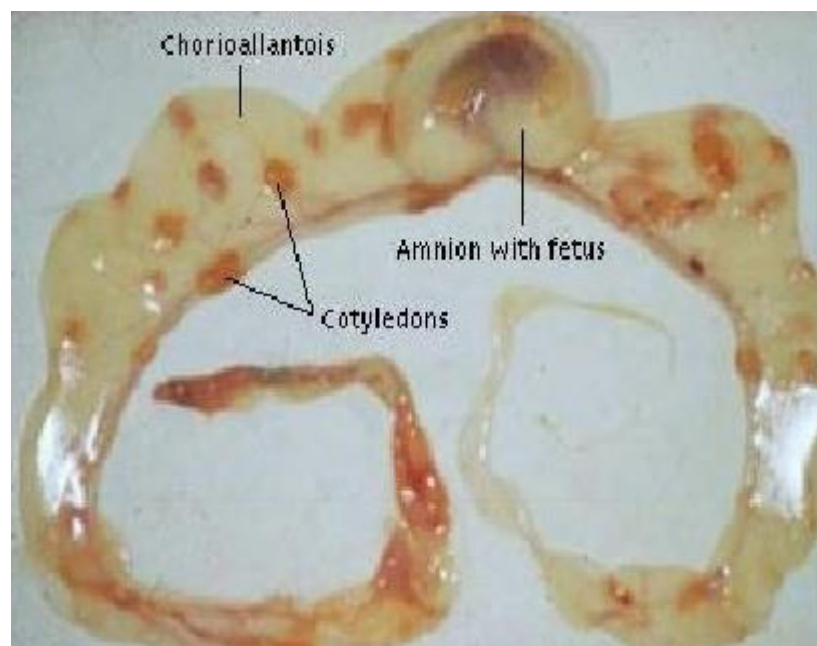


Fig. 48 Day 40 Fetus

Placenta started to form.

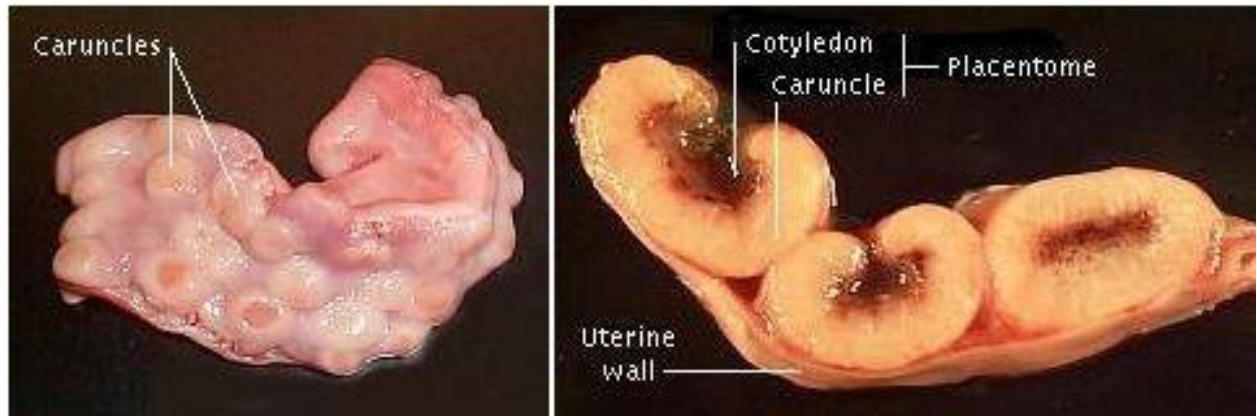


As we can see in Fig. 49, Cattle's placenta, the placentome is a combination of mother-side placenta (caruncle) and fetus-side placenta. The palpation of placentome become possible from Day75.

Caruncle: Maternal side
Cotyledon: Fetus side

} Placentome

Fig.49 Ruminant Placentome (sheep)



6-2. Importance of Early Pregnancy Diagnosis

The early pregnancy diagnosis is important because of the following reasons

- More calving number during the life-time of cows
- More Milk Production
- Too long drying period causes pre- & post- calving disease
- “Early Diagnosis, Early Treatment”

Optimum Calving Interval = 365 days

To achieve this, cows should be mated and become pregnant at 85 days after calving.

6-3 Methods for Pregnancy Diagnosis

There are several methods to diagnose pregnancy of cattle. However, still the rectal palpation is the choice of the method because of its cost and practicality.

Estrus Detection “Non-Return”(estimation only)

Rectal Palpation

Ultrasonography

Milk or Plasma Progesterone