

(G) Mature corpus luteum with two cavities (right) that were interconnected when viewed in real-time. The two follicles (left) are equivalent in size to the luteal cavities.

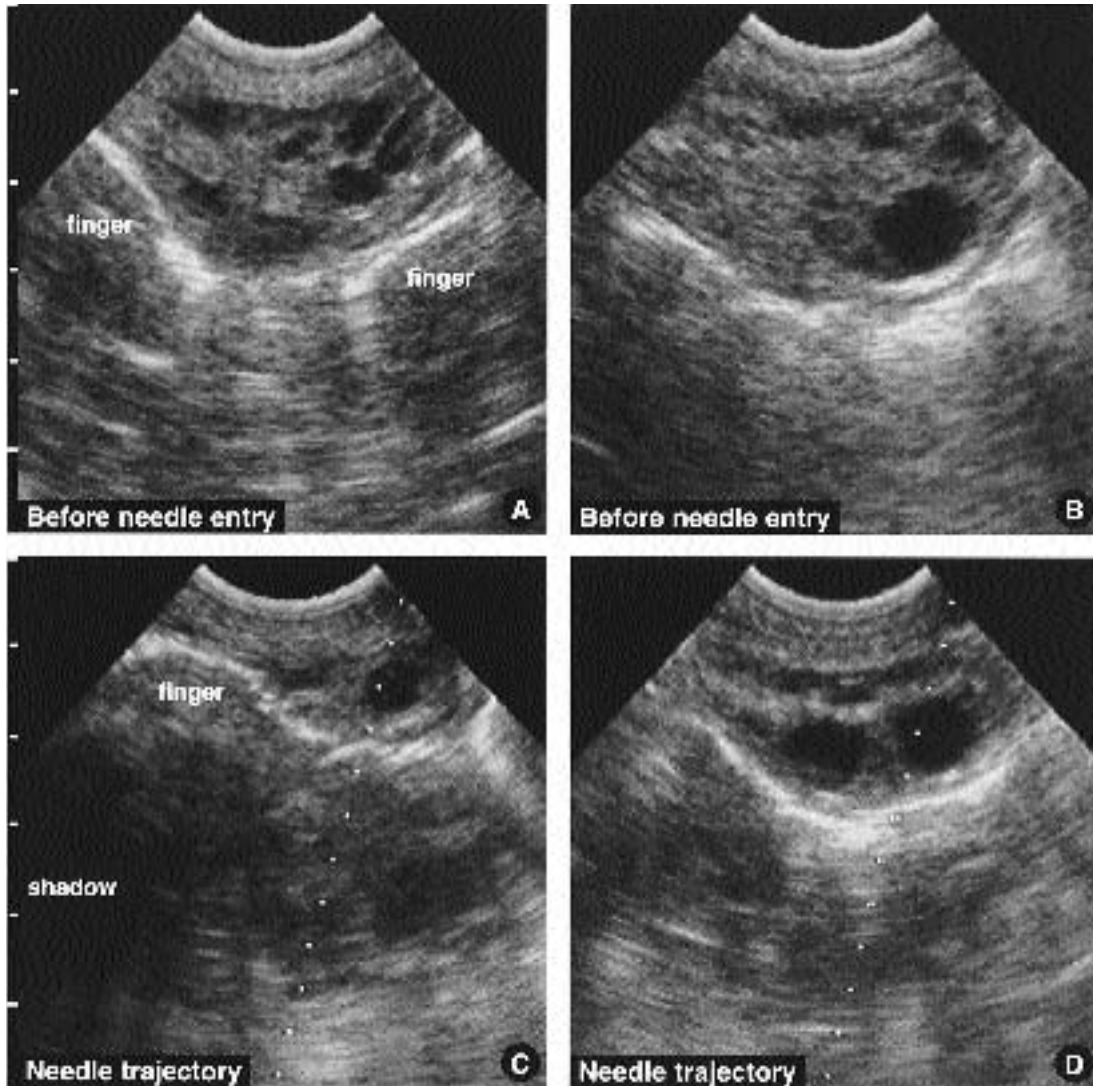
(H) Corpus luteum with a blood clot at the upper portion. The clot is more echogenic than the luteal tissue.

(I) Double corpora lutea with ovulatory papillae.

The corpora lutea (G-I) are atypical, but were selected to illustrate the power of ultrasonic imaging in displaying internal anatomy.

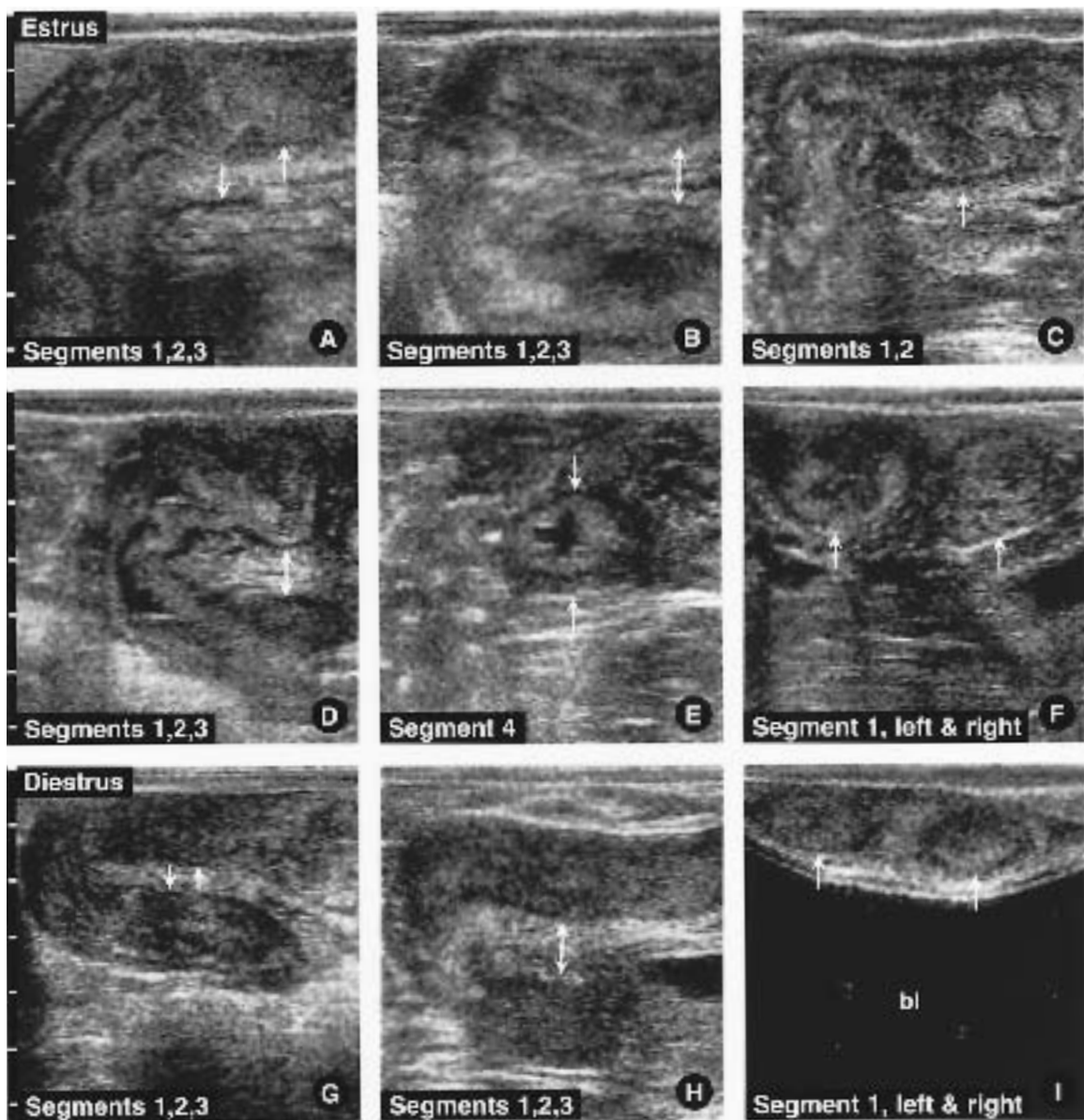
Oocyte Collection in Adults

The viewing screen



Ultrasonic images before oocyte collection. The sonograms are from a curvilinear transducer inserted into the vagina as described on the following pages. Follicles of various sizes are evident on all sonograms. Since the ovary is positioned transrectally, the fingers cast an image and shadow as shown (A,C); however, the fingers do not interfere with ovarian imaging provided they do not protrude between the transducer and ovary. The needle trajectory path is shown (C,D). A targeted follicle is positioned into the needle path.

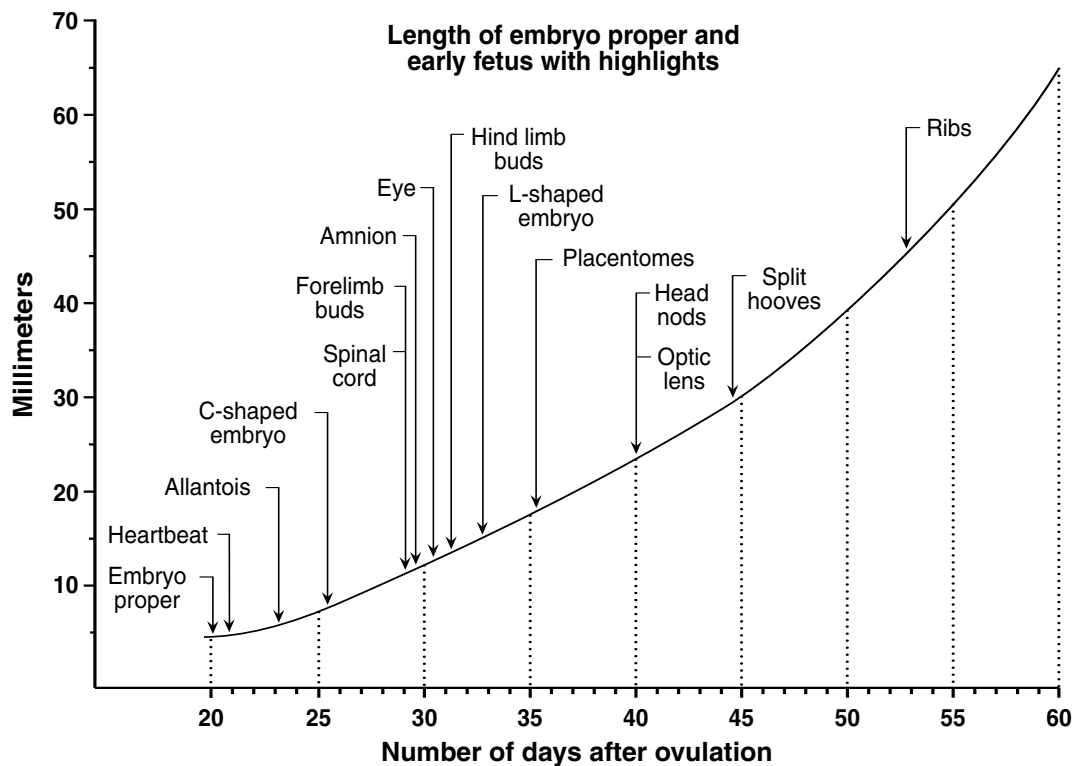
Sonograms



Sonograms of uterine horns from several cattle during the estrous cycle. Sonograms are from estrus (A-F) and mid-diestrus (G-I). In the longitudinal or sagittal views (A-D, G, H), the approximate location of the mesometrial attachment (pg 106) is indicated by arrows; the precise location of the periphery of the horn often is not clear. In the transverse views (F, I), the uterine tissue is indicated by arrows. The endometrium during estrus is, on average, more mottled in appearance than during diestrus. The mottling results from large echoic areas and from distinct anechoic areas

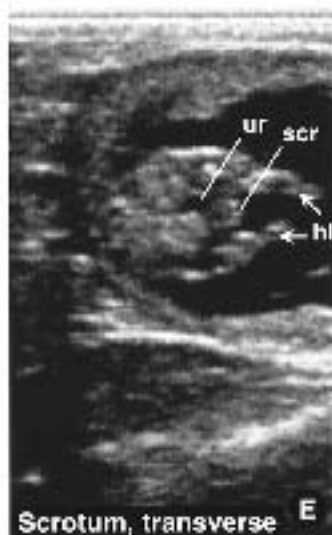
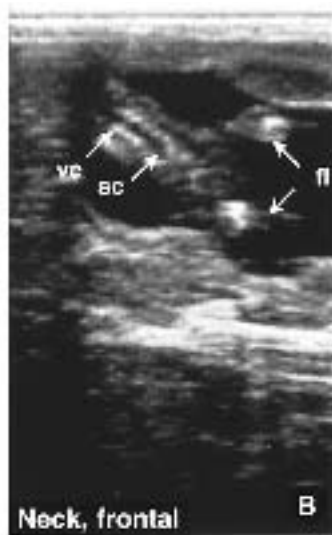
by Day 59. Other sites of future bone formation, as indicated by increased echogenicity on the ultrasound images, included the cranial area (especially the maxillary and mandibular regions), vertebrae, pelvic area, and limbs.

Other ultrasonic results given in subsequent literature reports seem consistent with the above findings (27, 197).

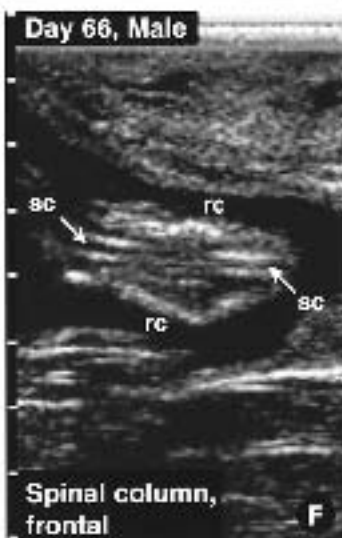


Summary of highlights and growth profile of length of embryo proper and early fetus.

Placentomes (facing page). Placentomes consist of cotyledons (fetal) and caruncles (maternal). The first six sonograms are from a reported study (46); numbers in the lower right corners are days of pregnancy, and an arrow in each image identifies the placentome. The two lower sonograms (A,B) illustrate well-developed placentomes. The placentomes were elevations on the surface of the uterine lumen and were first observed on Days 33 to 38. At first they were detected only in the area

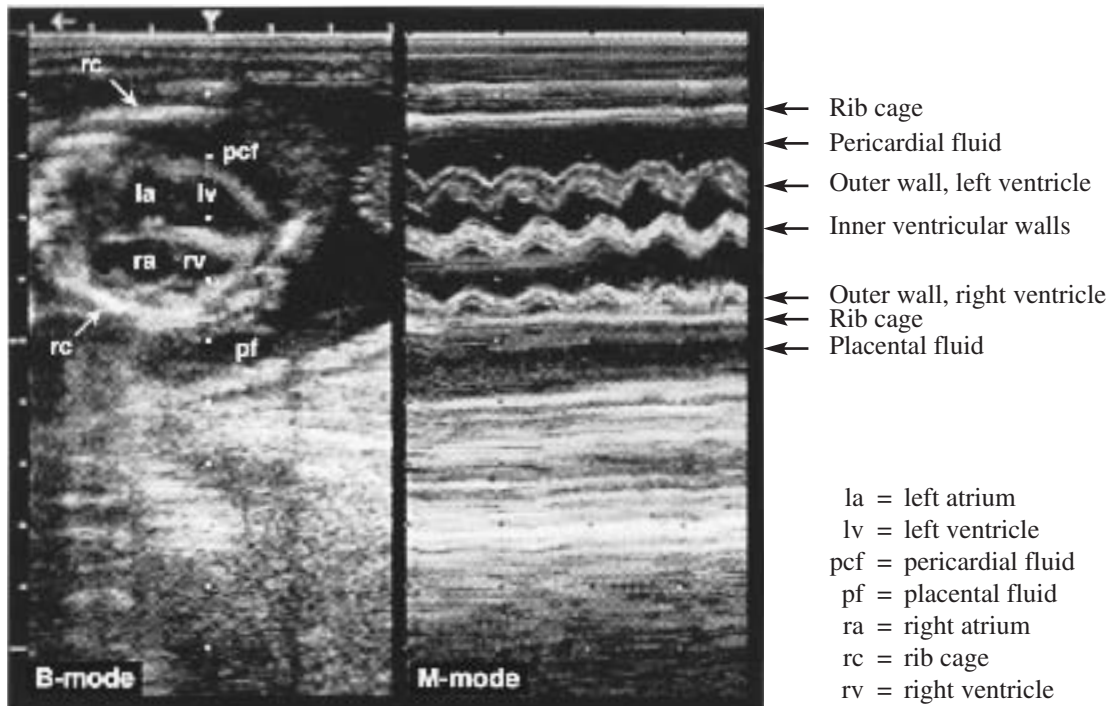


fl = front limb
 gt = genital tubercle
 hl = hind limb
 om = omasum
 rc = rib cage
 ru = rumen
 sc = spinal cord
 scr = scrotum
 uc = umbilical cord
 ur = urachus
 uw = uterine wall
 ve = vertebrae



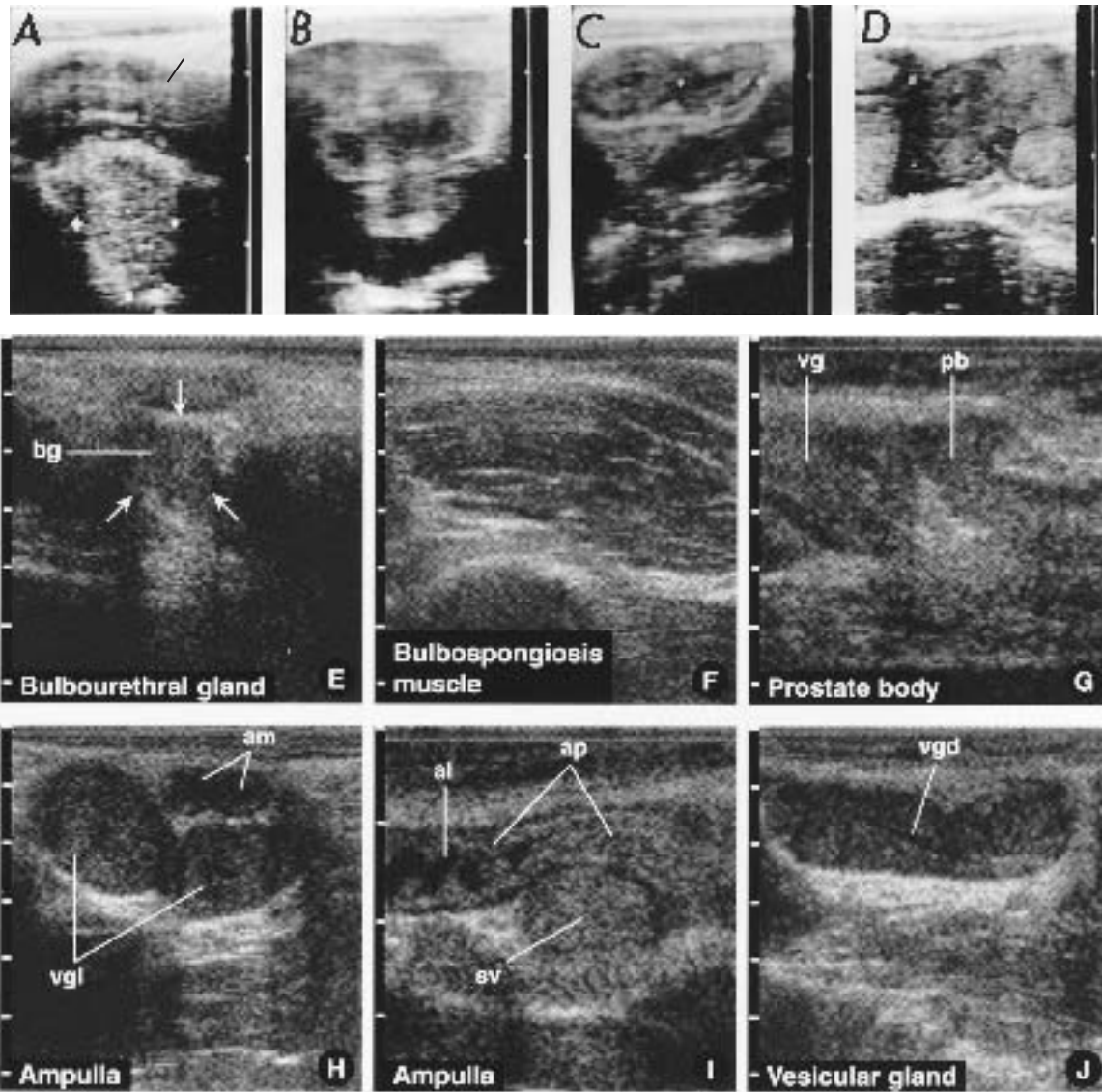
Trunk (mm)		Mean	Eye (mm)		Day
(204)	(99)		(pg 190)	(99)	
—	—	4	4	—	30
11	8	8	9	—	40
15	14	13	14	—	50
20	22	17	20	4	60
25	29	24	26	6	70
31	37	31	33	8	80
37	44	38	40	10	90
47	52	47	49	12	100
57	61	58	59	14	110
71	70	69	70	16	120
—	79	81	80	18	130
—	89	92	90	19	140
—	99	—	—	20	150
—	—	—	—	22	160
—	—	—	—	23	170
—	—	—	—	24	180
—	—	—	—	25	190
—	—	—	—	25	200
—	—	—	—	26	210
—	—	—	—	26	220
—	—	—	—	27	230
—	—	—	—	27	240

Trunk and eye diameters. Data were estimated directly with a straight-edge from published and unpublished mathematical regression lines. Trunk measurements can be used throughout the fetal stage until the lower portion of the trunk is beyond the depth of the ultrasound field (e.g., Day 140 for a 3.5-MHz probe). A suitable trunk measurement or estimate can be made whether the images are in cross section or longitudinal section, but a cross section at, or cranial to, the umbilical cord (mid-abdomen) or at the caudal end of the rib cage may be preferred. Both reports noted high correlation ($r \geq 0.95$) between body diameter and fetal age. Eye diameter is determined from the greatest diameter of the aqueous humor (anechoic) including anterior and posterior chambers (pg 152, Sonogram B). Eye diameter becomes less precise after Day 130 because the diameter increases only about 0.5 to 1.0 mm/10 days in the last half of pregnancy.



B-mode/M-mode images of a congested fetal heart at 98 days. The images are from the case of fetal hydrops described above. The relationships between B-mode and M-mode images and the information depicted on an M-mode image are described elsewhere (pg 174; Bk1-169). The labels (right) show the undulating lines on the M-mode image that represent changing depths at the column of dotted lines on the B-mode image.

Fetal hydrops (facing page). A second case of fetal hydrops detected on Day 100. The heart rate appeared normal (120 beats/minute). The collection of abdominal fluid (ascites) was obvious, especially between the organs and the abdominal wall (all sonograms). The separation of the intestinal folds (B-D) was less apparent than in the above case (pg 222). The diaphragm was well-outlined between the fluid-filled pericardial sac and the abdominal fluid (A). The extensive ascites raised the organs from the abdominal floor to expose and delineate the abdominal portion of vessels coming from the umbilical cord (D). The owner reported that abortion occurred a few weeks later.



Accessory sex glands. Sonograms A-D were provided by J. Weber and G. Woods.

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|-----------------------------|-----------------------------|
| al = ampullary lumen | ul = urethral lumen |
| am = ampulla | um = urethral muscle |
| ap = ampullary parenchyma | vg = vesicular gland |
| bg = bulbourethral gland | vgd = vesicular-gland duct |
| bm = bulbospongiosus muscle | vgl = vesicular-gland lobes |
| pb = prostate body | |