ANATOMY
The female reproductive anatomy is a fairly simple structure consisting of the following.

- **Ovaries (paired)**: secrete the natural reproductive hormones (estrogen and progesterone) and produce eggs, following the development of a follicle.
- **Oviducts**: two tubes that connect the ovaries to the uterus. Fertilization of the egg occurs here.
- **Uterus**: a muscular organ with two horns (left and right) that sustains the calf’s needs during pregnancy. The muscular walls of the uterus contract during birth to deliver the calf.
- **Cervix**: muscular,ringed tube that connects the uterus to the vagina. It is sealed off with a mucus plug during pregnancy to keep the calf free of infection.
- **Vagina**: (birth canal) connects the cervix to the vulva.
- **Vulva**: exterior of the cow’s reproductive tract.
THE ESTROUS CYCLE
Cows typically have a 21-day estrous cycle (range: 17–24 days). Heifers may experience their first estrous cycle anytime between 5 and 12 months, depending on breed and level of nutrition.

The estrous cycle consists of four phases.
1. Proestrus: the 2–3 day phase occurring just before the cow shows signs of “heat.” During this time the cow’s estrogen levels are increasing and follicles are developing on the ovaries. A thin, clear mucus discharge may be noticed.
2. Estrus: the phase commonly referred to as “heat.” The cow may bellow, be restless, and stand (“standing heat”) to be mounted by a bull or other cows. This phase lasts about 18 hours.
3. Metestrus: the 2–3 day phase after “standing heat” and ovulation usually occurs in the first 12 hours of this phase. A corpus luteum (CL), which produces the pregnancy hormone progesterone, is formed on the ovary at the site of ovulation. Midway through metestrus a blood-tinged vaginal discharge may be seen.
4. Diestrus: the longest phase of the reproductive cycle, lasting about 16 days. The CL continues to secrete progesterone. If the cow is not pregnant, a CL will normally dissolve after 17 days and the estrous cycle will begin again. If fertilization results in pregnancy, the CL will remain through the length of gestation.

Anestrus may also occur. This is a period of reproductive failure when the cow’s body does not cycle, no signs of heat are exhibited, and the cow cannot be bred.