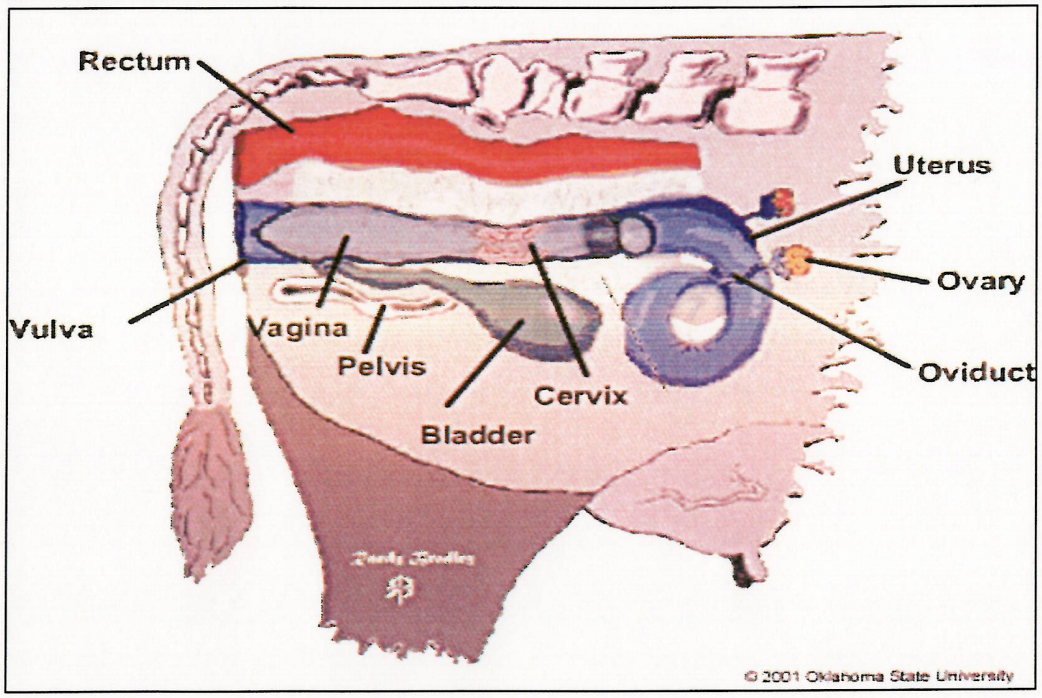
Anatomy of cow's reproductive system

今回は繁殖に関連した内容を海外からの研修生にも理解してもらうために、英語での説明にトライしてみました。ぜひ研修生にも一読してもらってください。誤字や説明不足があると思いますが、ご理解よろしくお願いいたします。

[Female reproductive tract]

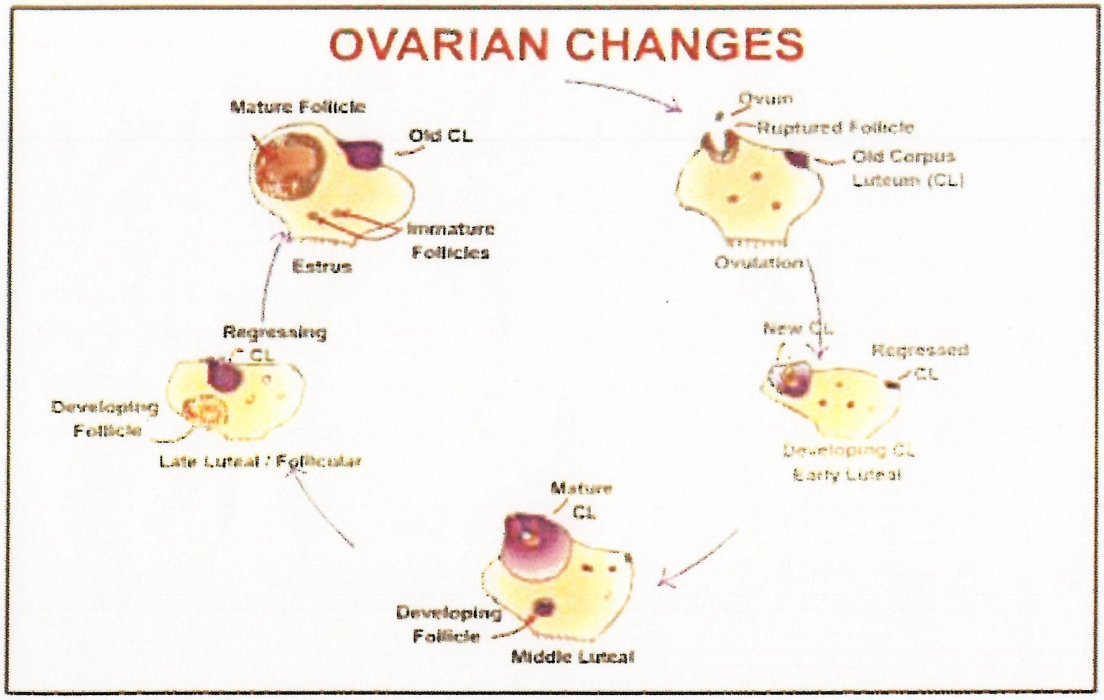


The structure of a cow's reproductive tract is similar to that of the human's. This figure is side view. The reproductive tract of cow is composed of the vulva, vagina. cervix, uterus, two uterine horns, two oviducts and two ovaries. The rectum is located above the reproductive system and the urinary bladder is below.

The vulva is the only part of the tract that you can see outside. And the first internal part is called vagina. The cervix is a narrow tube made up of dense connective tissues. The cervix acts as a physical barrier and protects the uterus from bacteria during pregnancy. The uterus consists of a body and two horns. The main function of the uterus is to provide an appropriate environment for fetal development. At the end of uterine horn, the oviducts are located. The oviducts carry the cow's eggs from the ovaries to the uterus.

The ovaries store eggs and produce hormones. In the ovary, you can find two predominant structures known as follicles and corpus luteums. Follicles contain the developing eggs. An ovary can often have several follicles on it, which vary in size. The largest one is called the dominant follicle and typically will rupture during ovulation (releasing the egg).

[Female reproduction system 2]

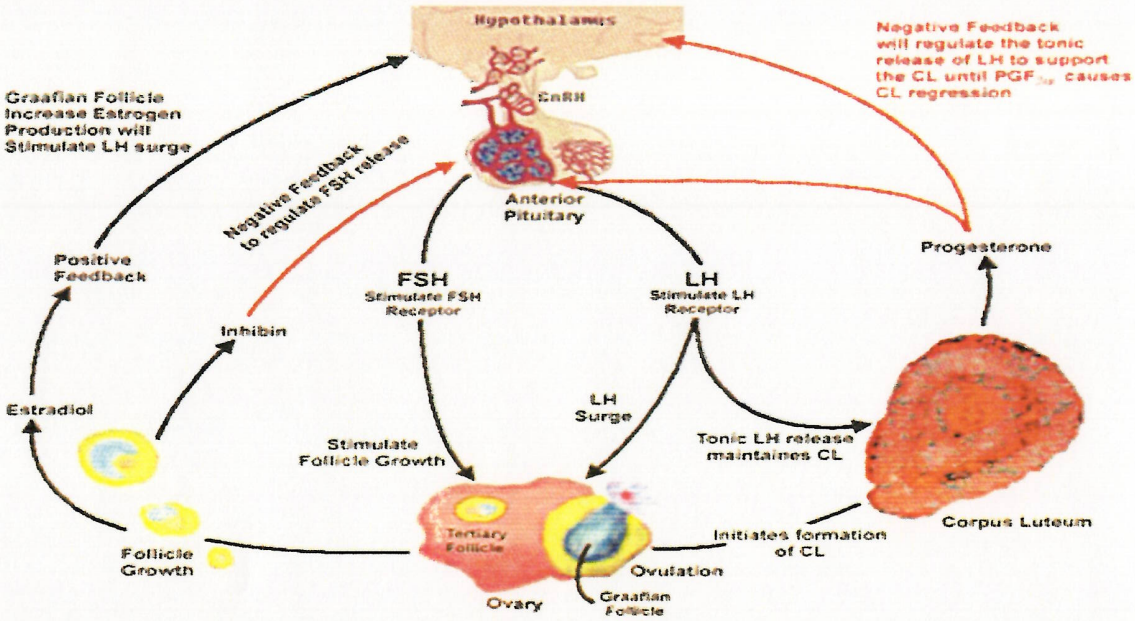


This cartoon is ovary of cow. Ovary is small, round bodies varying in size with the species and the stage of the estrus cycle. They are located one each at the end of the oviduct. Ovary has two predominant structures known as follicles and corpus luteums (CL).

The development and regression of the corpus luteum and of the follicles are continuous processes. Follicle develops and becomes mature follicle (dominant follicle). Just before ovulation, cows show estrus (heat). Ovulated follicle becomes corpus luteum. It develops and regresses. The most important point is that follicle doesn't ovulate when ovary has corpus luteum. This cycle (estrus cycle) is 21 days.

Ovulation: the discharge of the ovum (egg) from mature follicles and move toward uterus. If it encounters sperm while it is still alive, the two merge.

[Female reproductive system 3]



When we talk about reproduction, we need to think about hormone axes, Hypothalamic-Pituitary-Gonadal Axis. This is just cartoon of that physiology. Hypothalamus responses for producing hormone, GnRH. GnRH are transported through blood system, and enter pituitary. Pituitary produces gonadotropins, LH and FSH. And then these two gonadotropins are secreted into general (system) circulation. Target tissues (primary ovary) are stimulated by LH and FSH. FSH act on follicle to induce follicle growth and LH also act on follicle to ovulate.
Dominant follicle (largest follicle) secrets estradiol. And which then it induce GnRH surge which then induces LH surge and ovulation. Corpus luteum secretes progesterone and it suppresses secreting GnRH and LH.
Although not listed on this figure, PGF2α from uterine is important.

*GnRH:Gonadotropin-Releasing Hormone. GnRH is produced in the hypothalamus. It stimulates the release of gonadotropins, LH and FSH.

*LH: Luteinizing Hormone. LH is gonadotropic hormone from pituitary gland (at brain). An acute rise of LH is called LH surge, and LH surge cause ovulation.

*FSH: Follicule-Stimulating Hormone. FSH is also gonadotropic hormone from pituitary gland (at brain). FSH stimulates the growth of follicles in the ovary.

Yusuke IWASAWA