

FERTILITE HUMAINE & ANIMALE

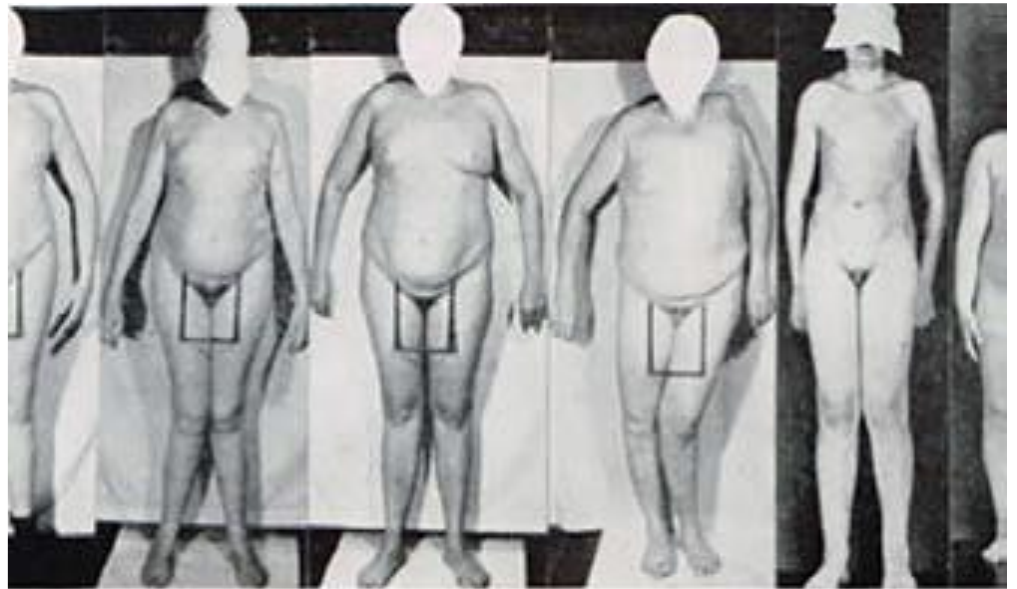


Le Syndrome de Kallmann (KS)



Aureliano Maestre
de San Juan (1828-1890).
Description en **1856**

Maestre de San Juan A. Falta total de los nervios olfactorios con anosmia en un individuo en quien existía una atrofia congénita de los testículos y miembro viril. *Siglo Médico* 1856;131:211.



Kallmann FJ, Schoenfeld WA, Barrera SE.
The genetic aspects of primary eunuchoidism.
Am J Mental Deficiency **1944**;XLVIII:203-36.



Nasal Placode

(Kallmann Syndrome)

- KAL-1 / Anosmin-1
- KAL-2 / FGFR1
- KAL-3 / Prokr2
- KAL-4 / Prokr2R
- KAL-5 / CHD7
- KAL-6 / FGF8
- KAL-7 / FEZF1
- FGF8
- FGF17
- NELF
- WDR11
- FLRT3
- SPRY4
- SEMA3A
- IL17RD

Hypothalamus

(Normosmic IHH)

- KISS1 - GPR54
- TAC3 - TAC3R
- LEP - LEPR
- HESX1 SPRY4
- IL17R
- HS6ST1
- DUSP6

GnRH1

GnIH

GnRHR

Anterior Pituitary

LH β
FSH β

Gonads

Testosterone/Estradiol
Gametogenesis

Valdes Socin & al. *New England Journal of Medicine* 2004
 Valdes Socin & al. *Journal of Clinical Endocrinology and Metabolism* 2009
 Valdes Socin & al. *Medicina (B Aires)* 2015
 Valdes Socin & al. *Austin Andrology* 2017
 Valdes Socin & al. *Urologic* 2018

BRIEF REPORT

Hypogonadism in a Patient with a Mutation in the Luteinizing Hormone Beta-Subunit Gene

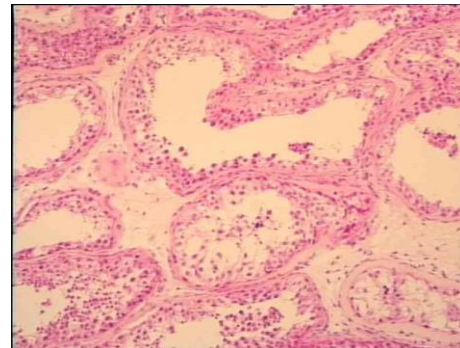
Hernán Valdes-Socin, M.D., Roberto Salvi, Ph.D., Adrian F. Daly, M.B., M.Sc.,
Rolf C. Gaillard, M.D., Pascale Quatresooz, M.D., Pierre-Marie Tebeu, M.D.,
François P. Pralong, M.D., and Albert Beckers, M.D., Ph.D.

Homme de 31 ans, XY

LH < 0.2 mUI/ml , non stimuable

FSH 23 mUI/l

Testostérone 0.3 µg/l



SYNDROME PRODUCED BY ABSENCE OF THE
GERMINAL EPITHELIUM WITHOUT
IMPAIRMENT OF THE SERTOLI
OR LEYDIG CELLS

E. B. DEL CASTILLO, ARMANDO TRABUCCO, AND
F. A. DE LA BALZE

*From the Endocrine Laboratory of the Hospital Rivadavia and Ward XVI of the
Hospital Alvear, Buenos Aires, Argentina*

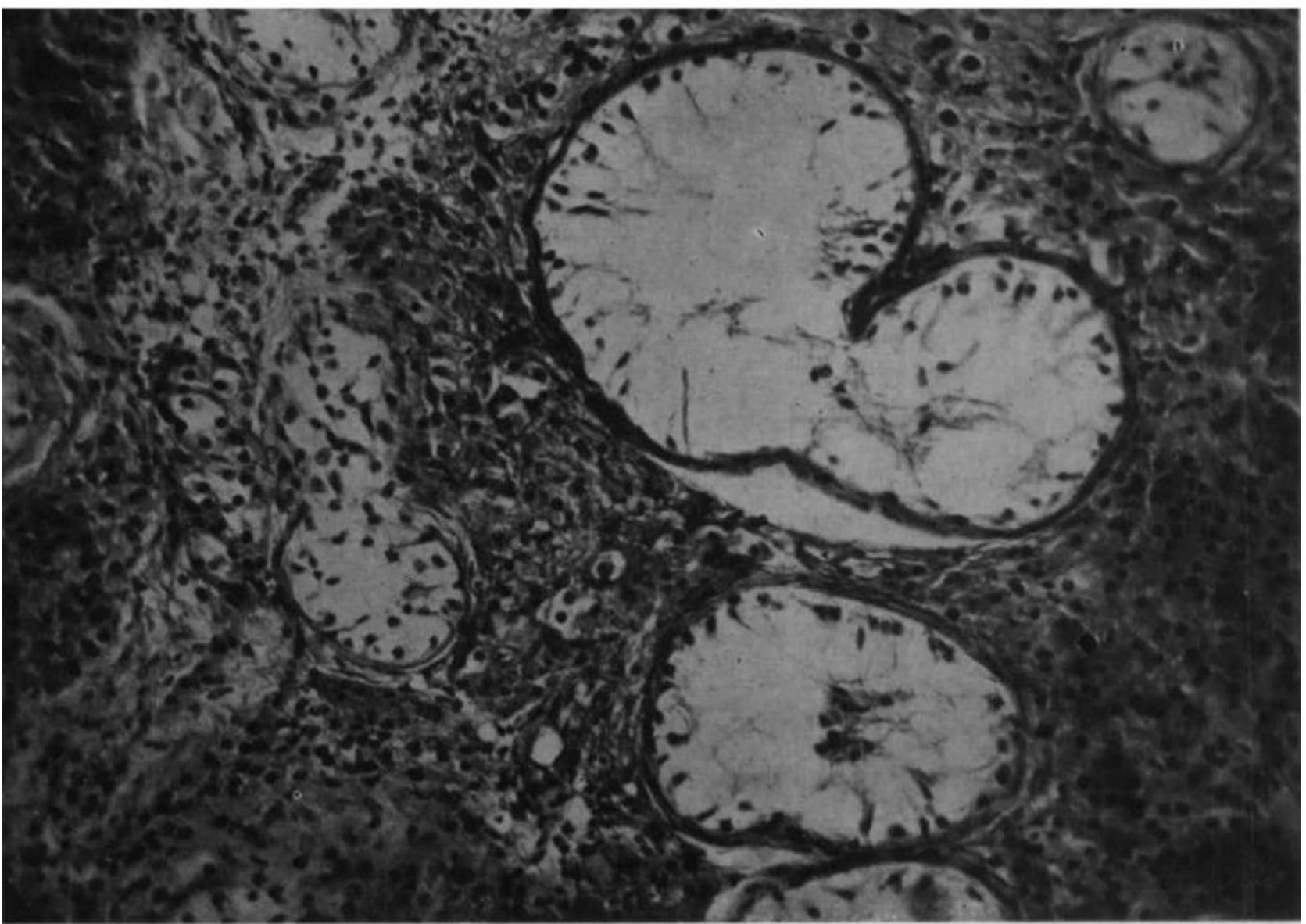
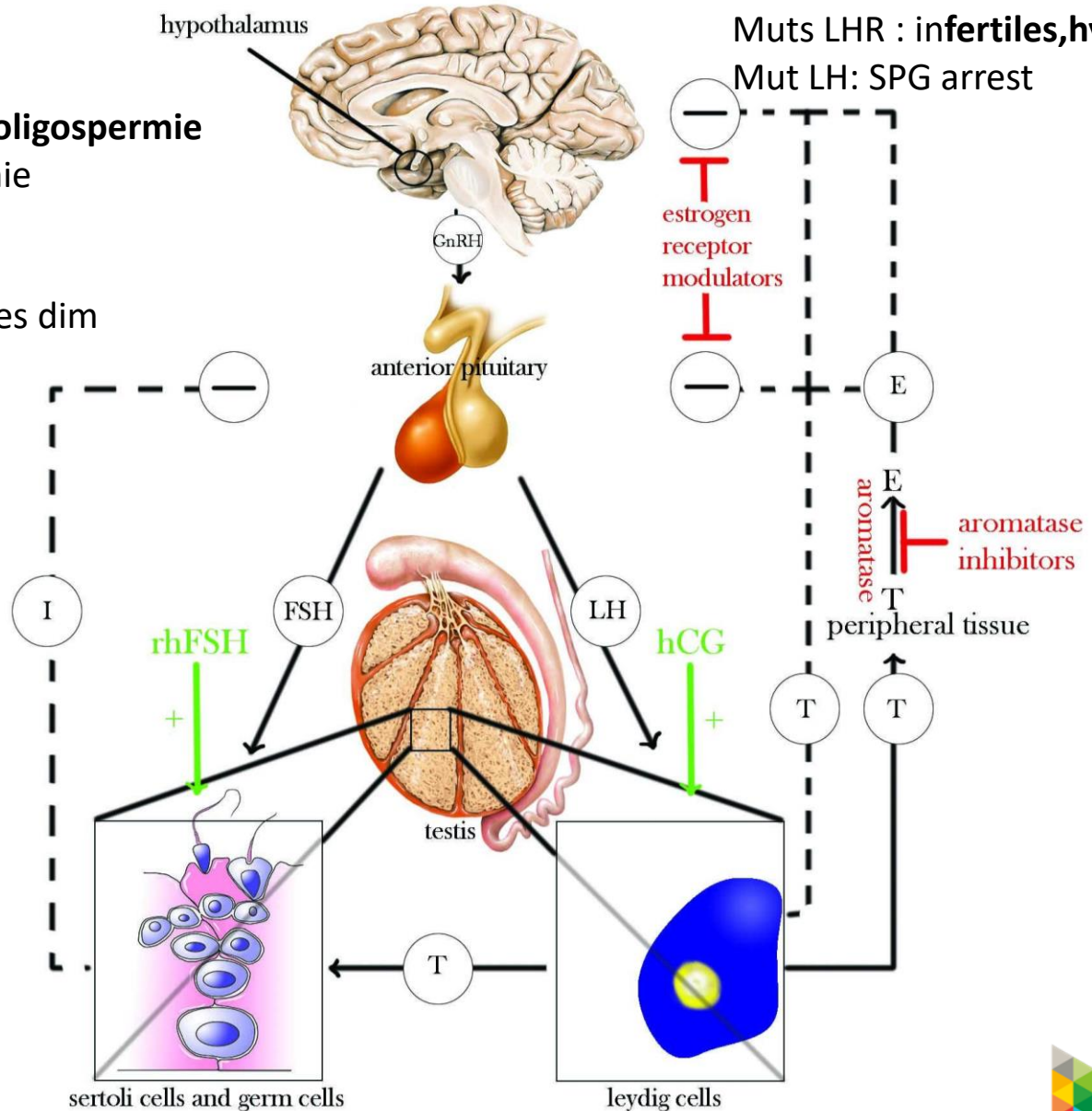


FIG. 1. Testicular Biopsy. (Low Magnification.)

Relance hormonale de l'Axe Gonadique

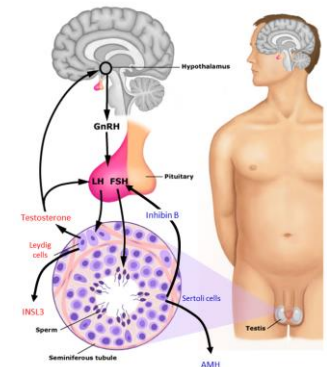
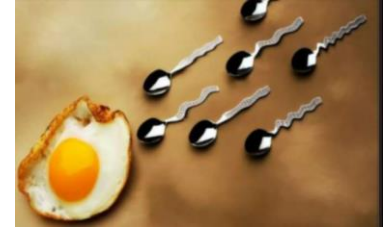
Mutations FSHR : **fertiles, oligospermie**
 Mutations FSH: azoospermie

Souris FSHKO-: Sertoli dim
 Souris FSHRKO: c germinales dim



INFERTILITE: Examens

- Spermogramme
- Evaluation endocrinienne
 - LH/testostérone/(œstradiol)
 - FSH/inhibine B
 - TSH-TPO/PRL
- Evaluation génétique
 - Caryotype
 - Microdéletions Ch Y
 - Mutations CFTR (mucoviscidose)



EQUINES: PITUITARY PARS INTERMEDIA DYSFUNCTION ON REPRODUCTIVE FUNCTION

- Dopaminergic neurodegeneration in certain subsets of hypothalamic neurons has been implicated as directly involved in the pathogenesis of PPID
- PPID is a **dopaminergic neurodegenerative** disease.
- Lipofuscin pigment is also abundant in the pituitary neurons of horses with PPID
- Neurologic impairment, including ataxia, blindness, seizures, and narcolepsy, has been suggested to occur in 6% to 50% of PPID cases
- Treatment of infertile mares with PPID involves administration of medication to suppress secretory activity of the pars intermedia (the current US Food and Drug Administration–approved drug of choice is pergolide, a dopaminergic agonist)

D. McFarlane

Equine pituitary pars intermedia dysfunction

Vet Clin North Am Equine Pract, 27 (1) (2011), pp. 93-113

Equine Metabolic Syndrome

- A diagnosis of EMS can be established based on history (previous bouts of laminitis), clinical signs (body condition score, other measures of adiposity; clinical signs of [laminitis](#); hoof capsule morphology), imaging (pedal radiography), and some laboratory documentation that identifies systemic IR/insulin dysregulation.²



N. Frank

Equine metabolic syndrome

Vet Clin North Am Equine Pract, 27 (1) (2011), pp. 73-92

High or Low Body Fat Deposition in the Presence of a Normal Oral Sugar Test is Not Associated With Postthaw Semen Parameters in Stallions

- This study compared the postthaw semen parameters of stallions with high and low body condition score (BCS) and evaluated associations between body morphometric parameters and postthaw semen parameters.
- Twenty stallions were split into Low BCS (BCS < 7, n = 11) and High BCS (BCS ≥ 7, n = 9) groups, and underwent a complete morphometric analysis (e.g., neck scores and circumference, crest neck height, body weight, and height), and subcutaneous body fat thickness (SFT) at the tail head, withers, shoulders, and retroperitoneal space.

GnRH therapy for subfertile stallions

- Controlled studies, 6., 31. on the other hand, have not demonstrated a dramatic improvement in seminal parameters or fertility. It is likely that the doses administered in these studies (5-10 pg) were insufficient and/or the degree of testicular degeneration was too advanced to see a response.
- [Hypogonadotropic hypogonadism](#) has not been documented in the stallion

- Azoospermia and Y Chromosome-Autosome Translocation in a Friesian Stallion. Ruiz AJ, Castaneda C, Raudsepp T, Tibary A.J Equine Vet Sci. 2019 Nov;82:102781. doi: 10.1016/j.jevs.2019.07.002. Epub 2019 Jul 11.

INFERTILITY - OBESITY

- **In humans:** fat deposition in the abdominal area, is correlated with poor sperm quality (15, 21), likely due to increased testicular temperature (17,24) and local inflammation (Hart et al JCEM 2016)
- **mice** fed with a high-fat diet, even if only until early adulthood, had lower sperm viability and motility, and higher incidence of head and tail defects.
- Although diet reversion with weight loss during adulthood prevents the progression of metabolic syndrome, **testicular content in fatty acids is irreversibly affected.**

FERTILITE & Nutrition/environ: PORCINS

– Boars being actively used for breeding are normally over 150 kg in weight, so a high temperature is very likely to have a negative effect on boar performance as boars on a low protein diet (<12%) or a reduced feed intake (<3 kg) have a reduced libido and semen volume

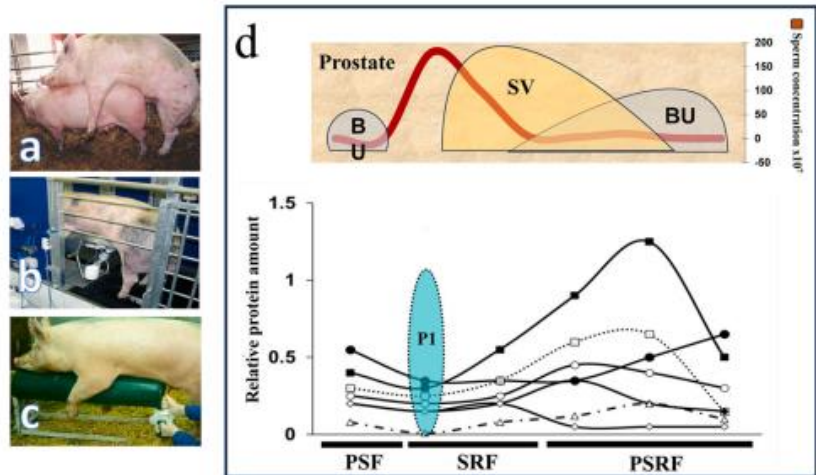
Louis et al The effect of protein intake on boar libido, semen characteristics and plasma hormone concentration. J Anim Sci 1994

-Effect of thermal stress on sperm production: elevated ambient temperatures have a negative effect on semen quality, such as sperm motility and percentages of normal sperm with non-aged acrosome are decreased

Mcnitt JJ, First NL. Effects of 72-hours heat stress on semen quality in boars. Int J Biometeorol 1970;14:373–80

PORCINS: Fertilité & Libido PGs

- the majority of the data on the effects of prostaglandin in the stimulation of sexual behavior and sperm output are based on studies that used a very small number of boars per treatment



Age-related decline in semen/ sperm quality

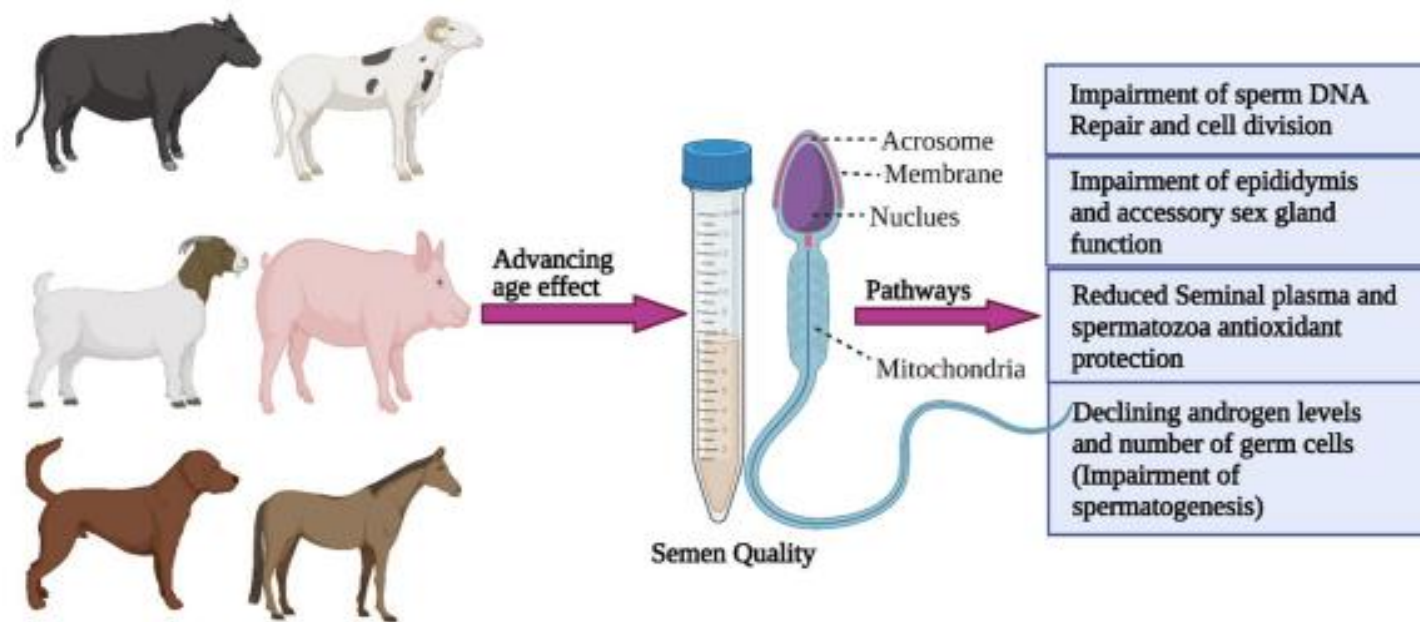
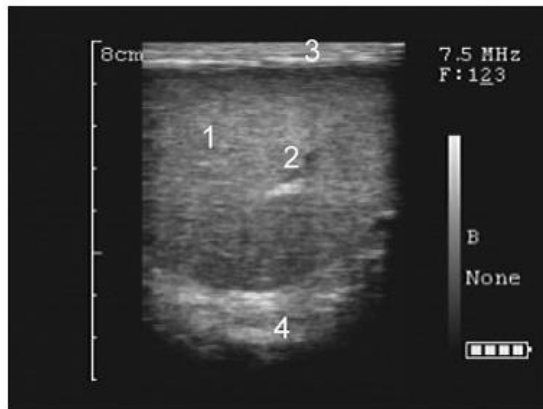


Fig. 1 Possible mechanisms of sperm cell aging. Created using <https://www.biorender.com>

Ultrasound Imaging of the Bull Reproductive Tract: An Important Field of Expertise for Veterinarians

Fig.5. Ultrasound testicle examination: transversal view. The probe is perpendicular to the long axis of the testicle.



2. Transversal: perpendicular to the principal axis of the testis (Figs. 5 and 6)



[Download: Download full-size image](#)