

Kuliah minggu ke 2

FISIOLOGI SEMEN

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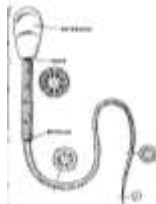
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SEMEN

Cairan yang disekresikan dari organ
kelamin jantan yang keluar pada saat
ejakulasi



Terdiri atas



spermatozoa



Plasma semen

PLASMA SEMEN (kelenjar aksesori)

FUNGSI

- ✓ MEDIA TRANSPORTASI
- ✓ BUFFER
- ✓ NUTRISI

SPERMATOZOA (Tubulus seminiferous)

SEL KELAMIN JANTAN (MATERI GENETIK)

KANDUNGAN BIOKIMIA PLASMA SEMEN

JUMLAH BESAR	JUMLAH KECIL
ASAM SITRAT	ASAM ASKORBAT
ERGOTIONIN	ASAM AMINO
FRUKTOSA	PEPTIDA
GPC	PROTEIN
SORBITOL	LIPID
	ASAM LEMAK
	ENZYM

KANDUNGAN LAIN :

- ✓ ANTI MIKROBA (SEMINAL PLASMIN)
- ✓ IMUNOGLOBULIN (Ig A)
- ✓ HORMON (ANDROGEN, ESTROGEN, PROSTAGLANDIN, LH, GH, INSULIN, GLUKAGON, PROLAKTIN, RELAXIN, CGLM, THYROID, ENCEPHALIN)

KOMPARATIF VOLUME DAN KONSENTRASI SEMEN TERNAK

Animal	Volume Total (ml)	Konsentrasi (10 ⁶)
Stallion	50–100	100–150
Boar	100–150	100–200
Bull	3–5	800–1200
Ram	0.3–1.0	1200–2000
Cock	0.10–0.3	5000–9000
Dog	2–25	60–540
Guinea pig	0.4–0.8	5–20
Rabbit	0.4–0.6	50–350
Goat	0.5–2.5	1000–5000

KOMPOSISI PLASMA SEMEN DARI BEBERAPA TERNAK DOMESTIK

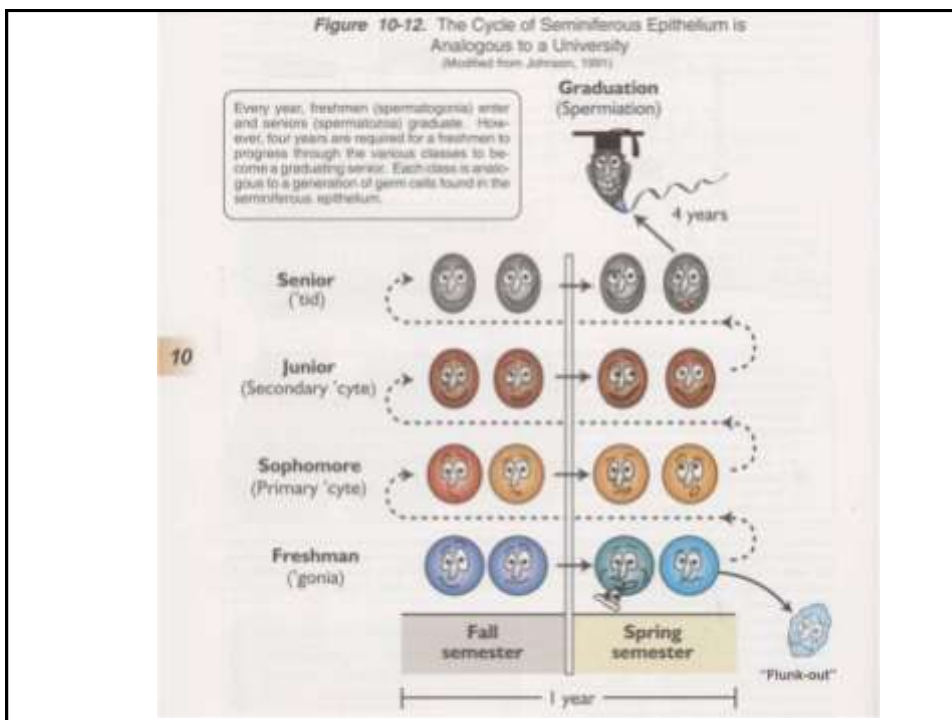
Component	Stallion	Bull	Boar	Dog	Rabbit	Ram	Cock
Protein	1.2–12	30–80	37	21–37	–	50	18–28
Fructose	0.02–0.08	1.2–6.0	0.09–0.4	< 0.01	0.4–1.5	1.5–6.0	0.04
Glucose	0.82						
Sorbitol	0.2–0.6	0.1–1.4	0.06–0.18	< 0.01	0.8	0.26–1.7	0–0.1
Citric acid	0.08–0.53	3.57–10	0.36–3.25	0.04	–	1.1–2.6	0.0
Inositol	0.19–0.47	0.25–0.46	3.8–6.3	–	–	0.07–0.15	0.16–0.2
Ascorbic acid	–	0.09	–	–	–	0.05	–
Ergothioneine	0.03–1.1	< 0.01	0.06–0.3	–	–	0.0	0–0.02
Glycerylphosphorylcholine	0.4–3.8	1.1–5.0	1.1–2.4	1.8	2.5–3.7	11–21	0–0.4
Glutamic acid	–	0.35–0.41	–	–	–	0.76	–
Sodium	2.57	2.25	5.87	3.32	–	1.78	3.52
Potassium	1.03	1.55	1.97	0.31	–	0.89	0.61
Phosphorus	0.02–0.07	–	–	–	–	–	–
Calcium	0.26	0.4	0.06	0.05	–	0.06	0.1
Magnesium	0.09	0.08	0.05–0.14	0.04	–	0.06	0.14
Chloride	4.48	1.74–3.2	2.6–4.3	4.4	–	0.86	1.47
Bicarbonate	–	7.1	–	2.9	–	7.1	–
a -Mannosidase	–	400	–	–	–	50	–
b -N-Acetylglucosaminidase	625	15,000	–	–	–	16,000	–
pH	6.2–7.8	6.48–7.8	6.85–7.9	6.1–7.0	6.59–7.5	5.9–7.3	7.2–7.6
Osmolarity	142–334						

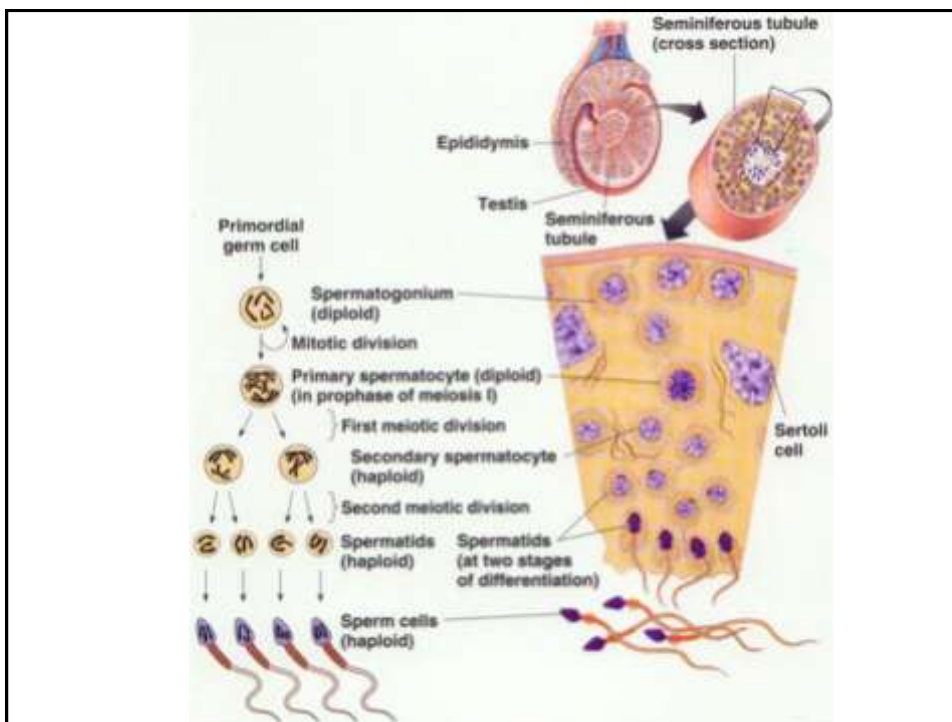
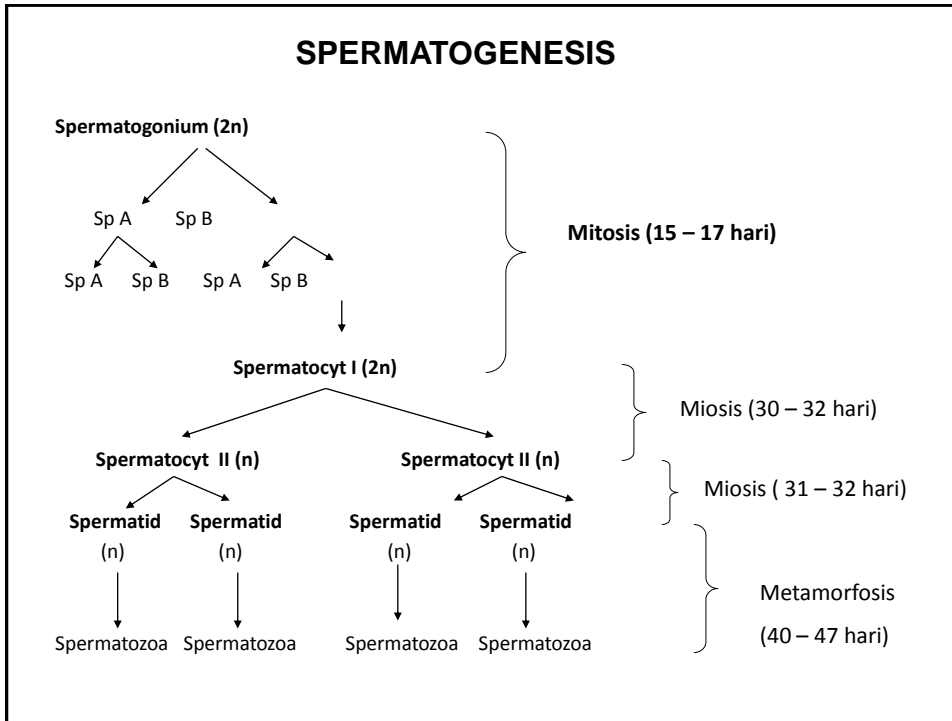
SPERMATOGENESIS

Proses pembentukan spermatozoa dari spermatogonium yang terjadi di dalam tubulus seminiferus dari testis

Ada dua proses :

- spermatocytogenesis
- spermiogenesis





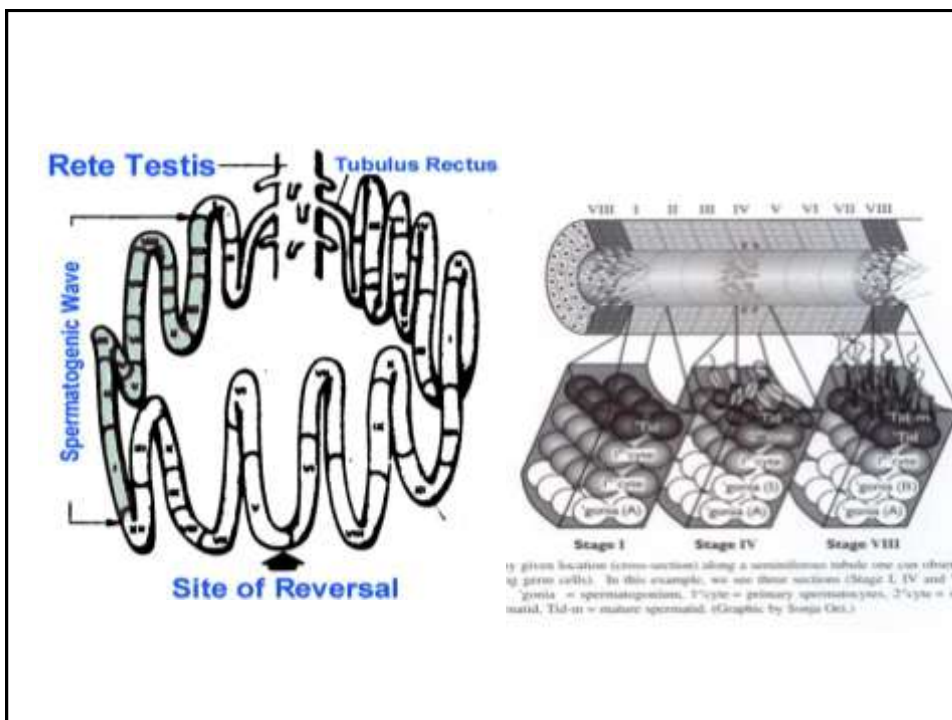
SPERMATOCYTOGENESIS

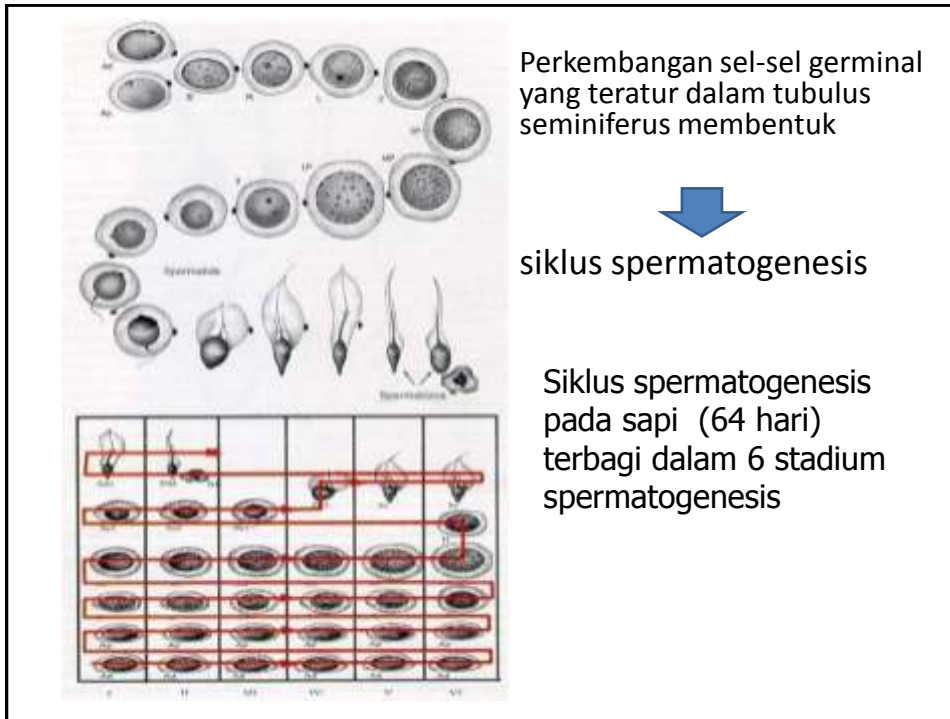
Spermatogonium → spermatisit I
 → spermatisit II → spermatid

Proses pembelahan sel : mitosis & miosis

Hormon yang terlibat : FSH, ICSH dan Testosteron

Sel yang terlibat : Sel sertoli dan Sel Leydig





SPERMIOGENESIS

- Metamorfosis spermatid → spermatozoa
- Inti sel mengumpul di bag. anterior
- badan golgi mengumpul di depan inti
- terbentuk vacuola berisi :
- idiosome (akrosomik granule/proakrosome)

↓

- akrosom, cairan vacuola

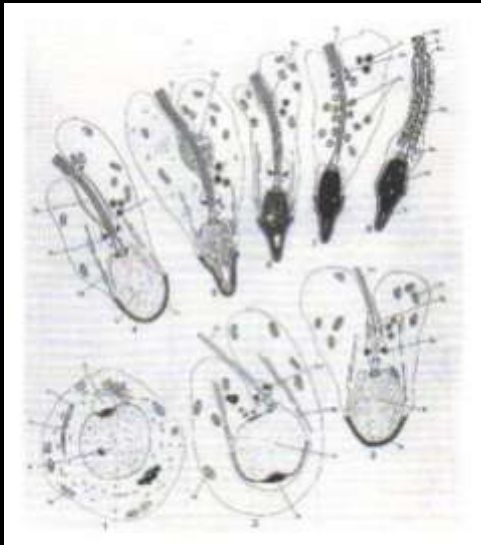
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badan golgi pindah ke posterior → leher

↓

Sentriol
mitokhondria

Gambaran skematik proses metamorfosis



- 1 : Fase Golgi
- 2-4 : Fase Cap (tudung)
- 5-6 : Fase Akrosom
- 7-8 : Fase Pematangan

Table 10-1. Duration of the Stages of the Cycle of the Seminiferous Epithelium in Various Species

Stage	Bull	Ram	Boar	Stallion	Rabbit
I	4.2	2.2	1.1	2.0	3.1
II	1.2	1.1	1.4	1.8	1.5
III	2.7	1.9	0.4	0.4	0.8
IV	1.7	1.1	1.2	1.9	1.2
V	0.2	0.4	0.8	0.9	0.5
VI	0.8	1.3	1.6	1.7	1.7
VII	1.1	1.1	1.0	1.6	1.3
VIII	1.6	1.0	0.8	1.9	0.9
TOTAL^A	13.5	10.1	8.3	12.2	11.0
SPERMATOGENESIS^B	61	47	39	55	48

^ATotal days required for 1 cycle of the seminiferous epithelium

^BApproximate days to complete spermatogenesis (spermatogonia to spermatozoa)