- Substances acting on the urogenital system
- Hormones
- Vitamins
Diuretic substances

Enhance diuresis, which is greater when:
- the hydrostatic pressure of the blood increases;
- when the osmotic pressure increases (thus slowing down resorption in the convoluted tubules in the case of acidosis and hyperkalemia, in the case of hypernatremia it is the reverse);
- by extending the filter surface of the renal glomeruli.

It is recommended in all cases of retention water in tissues (nephrosis, chronic nephritis, ascites, dropsy, edema).

http://1.bp.blogspot.com/_1LjYcnDCzo0/SjGPBN5SII/AAAAAAAAHI/UdEkVb3UeHo/s400/aparato%2Burogenital%2Bfemenino.gif
Purinic diuretics

Caffeine
Small doses produce renal vasodilation and diuresis, and in high concentrations vasoconstriction in the kidney, this is due to the stimulation of the vasomotor center. It is considered "unfaithful diuretic".

Theobromine
is a dimethyl-xanthine.
White powder, odorless, bitter, very sparingly soluble in water. As diuretic gives very good results in edemas. It has antispastic activity, being used in hypertensive disease.
Diuretin

- mixture of sodium theobromine and sodium salicylate, in equal parts.
- white powder, amorphous, hygroscopic, odorless, sweet-tasting.
- is more irritating to the gastrointestinal mucosa.

Theophylline (dimethylxanthine).

- It is found in tea leaves alongside caffeine.
- It is synthetically prepared too.
- stronger diuretic action, but shorter action than diuretin and theobromine.

Miofilin (aminophylline)

- combination of: ethylene diamine and theophylline, in equal parts.
- yellowish powder, with ammonia odor, bitter.
- in the treatment of edema, dropsy, asthma.
Mercurial diuretics

Calomel (mercurious chloride)
- diuretic qualities, acting delayed, for long-term (days),
- can cause poisoning and diarrhea.
- in therapy 2 weeks breaks are recomanded.

Mercurophylline (Novurit)
- organic compound effective as a diuretic, less toxic.
- in 10% solution,
- good results in edemas of cardiac origin and
- ascitogenic cirrhosis.
Digitalic diuretics

Also called *indirect diuretics* because the diuretic effect is achieved actually by stimulating the heart, increasing the contractile force (positive inotrope).

This causes improving of circulation, including the kidneys too where blood pressure will acquire high levels.

It produces: vasodilation and in the end increased urine output.

This includes all cardiotonic drugs.
Saline diuretics

Calcium chloride

▶ **diuretic** = decreases tissue and vascular permeability, hindering the passage of water in tissues.
▶ **good preventive agent of exudates.**
▶ **in: nephrosis because it produces hidremia.**
▶ **by enteric excretion of calcium, chlorine remains free and it will fix sodium such that the removal of sodium chloride through the kidneys doubles.**

Ammonium chloride

- reduces the alkaline reserve by combining chlorine with sodium from sodium carbonate, resulting acidification and favoring diuresis.
Potassium nitrate
- whitish crystalline substance, bitter, soluble in water.
- intense effect, of short duration due to absorption and rapid elimination.
- cause gastrointestinal irritation, hypotension, cardiac depression due to the potassium ion.

Potassium acetate
- white powder, very soluble in water.
- in contrast to potassium nitrate, is not as toxic.
- is administered p.o., with plenty of water.
Sulfamidic diuretics

Furosemide (Dimazon)
- **Intense diuretic action,** rapid and sustainable.
- **Recommended** in ascites, dropsy, edema.

Acetazolamide (Ederen)
- **Powder,** yellowish-white, odorless, tasteless, hardly soluble in water.
- **Diuretic by inhibiting carboanhydrase** which will decrease the rate of sodium and hydrogen ion exchange, which occurs in the renal tubules,
- **Thus favoring the remove of sodium ions** through alkalainized urine, situation that will lead to acidification of the internal environment.
<table>
<thead>
<tr>
<th>D.C.I. / chemical structure</th>
<th>Pharmaceutical products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorestolone,</td>
<td>Flonatril, Klorex, Nefrolan, Speciatensol</td>
</tr>
<tr>
<td>Mefruside,</td>
<td>Baycaron, Mefrusal</td>
</tr>
<tr>
<td>Methydrane</td>
<td>Alintan, Isopren, Kastarol, Diometin, Saludriuretic</td>
</tr>
<tr>
<td>Metolazone</td>
<td>Metenix 5, Zaroxolyn</td>
</tr>
<tr>
<td>Quinethazone</td>
<td>Aquamox, Hidrotazin, Hidrox, Quenamox</td>
</tr>
<tr>
<td>Torsemide</td>
<td>Demadex</td>
</tr>
<tr>
<td>Ambuside</td>
<td>Hydrion</td>
</tr>
</tbody>
</table>

Other sulfonamide diuretics structures
The action of carbonic anhydrase and diuretics occurring at the level of the proximal convoluted tubule
**Nefrix (Esidrex)**

- white, pale yellow, odorless, insoluble in water.
- officinal, more active diuretic,
- action lasting for several hours.
- hypotensive potentiating effect of antihypertensive drug.
- is administered p.o., as tablets.

**Ufrlx (Butizide)**

- thiazine derivative similar to Nefrix,
- 4 times greater activity.
- is administered p.o.
Action of thiazide diuretics

Tubul contort distal

Diuretice tiazidice
Other representatives of sulfonamides thiazides

<table>
<thead>
<tr>
<th>DCI / Chemical names</th>
<th>Pharmaceutical products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altizide</td>
<td>Aldactazine Aldozone</td>
</tr>
<tr>
<td>Bemetizide</td>
<td>Tensigradyl</td>
</tr>
<tr>
<td>Benzthiazide</td>
<td>Aquatag Dihydrex Diteriam Exna Exosalt Fovane</td>
</tr>
<tr>
<td>Butizide</td>
<td>Eunerphan Saltucin</td>
</tr>
<tr>
<td>Cyclopenthiazide,</td>
<td>Navidrex Navidrex-K</td>
</tr>
<tr>
<td>Hydroflumethiazide,</td>
<td>Hydrenox Diucardin Saluron</td>
</tr>
<tr>
<td>Paraflutizide</td>
<td>Corzid Detensitral</td>
</tr>
<tr>
<td>Polythiazide</td>
<td>Nephril Renese Drenusil</td>
</tr>
<tr>
<td>Cyclothiazide</td>
<td>Anhydron</td>
</tr>
<tr>
<td>Teclothiazide</td>
<td>Chymodrex Depleil Deplet</td>
</tr>
<tr>
<td>Trichlomethiazide</td>
<td>Esmarin Fluitran</td>
</tr>
</tbody>
</table>
Vegetal diuretics

- are drugs containing volatile oils
- irritating to the nephrons, at the same time renal vasodilators.
- some of the drugs include salts of potassium and glycosides.
- is used in the form of infusion or decoct 5-6%.

Diuretic teas:
- horsetail,
- parsley fruits,
- corn silk,
- lovage root,
- rest harrow (Ononis spinosa) root,
- licorice root,
- juniper,
- leaves and buds of birch,
- cornflower (Centaurea cyanus) flowers,
- bearberry leaves.
Other diuretics

Hypertonic solutions
✦ acts by increasing osmotic pressure,
✦ prevents reabsorption which takes place in the renal tubules.
✦ acts also through hydremia.

Isotonic solutions
✦ acts due to the increased amount of circulating liquid and therefore the hydrostatic pressure of the blood,
✦ following the introduction of iv of this solutions, diuresis increases more.
Hypotonic solutions:

- are: *mineral water, water, administered per os.*
- are absorbed into the blood, and leads dissolved substances from cells and
- loaded this way, they return to the blood.
- and from here elimination occurs through the kidneys.
- the intensity of the diuresis is proportional with the amount of introduced hypotonic solutions and the rapidity of absorption of these solutions.

Solutions for perfusions

- perfusion substances with mannitol an sorbitol.
- mannitol solutions are solutions of 5, 10, 20%, are officinal.
- entered into the body, about 90% of the a.s. passing through the glomeruli will not absorb in the tubules, thereby retaining the equivalent amount of water.
Sorbitol solutions
- sorbitol = the alcohol resulting from the reduction of glucose and fructose.
- are in concentration of 5, 10, 40% and are officinal.
- are used as the previous, having sustained diuretic effect.

Edecrin
- similar in action with furosemide.
- used in human medicine.

Spironolactone
- synthetic substance analogous to aldosterone (corticosteroid regulating electrolyte balance), but with which is antagonistic.
Diuretic action that maintain potassium
Antidiuretic substances
Vasopressin

- posthypophyseal hormone with pronounced antidiuretic role, when it is administered at lower doses than the vasopressor doses.

Retrohipofiza

- commercial product, contains 1g vasopressin,
- is used in *diabetes mellitus* in dogs.
Urinary antiseptic substances
This category includes:
sulfonamides, antibiotics, nalidixic acid, nitrofurantoin, methylene blue, that due to renal elimination have sustained antiseptic activity.

Urotropin (methenamine)
- antiseptic and reductive activity.
- exerts its effect on the urinary tract due to the release of formaldehyde in acidic urine.
- in: urinary infections resistant to antibiotics and chemotherapeutic.
**Salol** (phenyl salicylate)
- white crystalline powder, peculiar, characteristic odor and taste,
- soluble in organic solvents and alcohol, very sparingly soluble in water.

**Urovalidin**
- cycloserine derivative.
- contains: pherizidone and phenazopyridine, which combines broad antibacterial spectrum with antisepsis and local analgesia.
- in: acute and chronic infections of the urinary tract,
- under the form of tablets.

**Copaiba balsam**
- extract from Copaifera reticulata, leguminous plant.
- is one of the best urinary antiseptics.

**Sandalwood oil**
- volatile oil, urinary antiseptic, in a lesser extent is diuretic.
Hormonal type substances

Hormones

- endogenous biocatalysts released by endocrine glands,
- specific role in regulating body functions.
- the entire body, hence the endocrine system, is related to the hypophysis and is subordinate to it ("glandular brain"),
- the pituitary gland and the coordinating nervous system = neuro-hormonal system,
- the hormones continues the action of the nervous system,
- hormone insufficiency = eliminated by hormonotherapy.
Pituitary hormones
**Anterior lobe of the pituitary gland** develops:
- FSH
- LH
- ACTH
- STH
- TSH
- para-TSH
- hyperglycemia

**Posterior lobe produces:**
- oxytocin
- vasopressin
- melanophores (Inter medio-pituitary)

**Sphere of reproductive hormones of practical interest:**
- GnRH
- Anterior pituitary hormones
- Posterior pituitary hormones
- Placental gonadotropins
- Sexual steroids
- Corticosteroids
- Prostaglandins
- Uterine contraction
- Uterine spasmolytic
- Relaxin
- Melatonin
### Pharmacological approaches to control the timing of ovulation of farm animals

**Induction of follicular phase through use of exogenous progestins (synthesis Cristina)**

<table>
<thead>
<tr>
<th>Used product</th>
<th>Hormone dose</th>
<th>Method of administration</th>
<th>Duration of treatment (days)</th>
<th>Luteolytic agent</th>
<th>Species</th>
<th>Heats appearance (days)</th>
<th>Fertility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progesterone</td>
<td>1,55 g P</td>
<td>intravaginal device</td>
<td>10-12</td>
<td>10 mg estradiol</td>
<td>Bovines</td>
<td>2-4</td>
<td>Normal</td>
</tr>
<tr>
<td>Progesterone</td>
<td>375 mg P</td>
<td>intravaginal device</td>
<td>12-14</td>
<td>No luteolytic agent</td>
<td>Bovines</td>
<td>2-3</td>
<td>Normal</td>
</tr>
<tr>
<td>Norgestomet</td>
<td>5 mg OV + 3 mg norgestomet</td>
<td>ear implant</td>
<td>9-10</td>
<td>Estradiol valerate and norgestomet</td>
<td>Beef cattle, heifers</td>
<td>2-4</td>
<td>Normal</td>
</tr>
<tr>
<td>Progesterone + estradiol</td>
<td>100 mg P + 10 mg estradiol</td>
<td>daily injections</td>
<td>10-14</td>
<td>No luteolytic agent</td>
<td>horses</td>
<td>3-7</td>
<td>Normal</td>
</tr>
<tr>
<td>MAP</td>
<td>60 mg</td>
<td>vaginal pessaries</td>
<td>12-14</td>
<td>No luteolytic agent</td>
<td>Sheeps</td>
<td>1-3</td>
<td>Normal</td>
</tr>
<tr>
<td>FGA</td>
<td>30 mg</td>
<td>vaginal pessaries</td>
<td>12-14</td>
<td>No luteolytic agent</td>
<td>Sheeps</td>
<td>1-3</td>
<td>Normal</td>
</tr>
<tr>
<td>Allyl-trenbolone</td>
<td>25-30 mg</td>
<td>orally</td>
<td>10-12</td>
<td>No luteolytic agent</td>
<td>Horses</td>
<td>3-7</td>
<td>Normal</td>
</tr>
<tr>
<td>Allyl-trenbolone</td>
<td>27.5 mg/ zt⁻¹</td>
<td>orally</td>
<td>18</td>
<td>No luteolytic agent</td>
<td>Swine</td>
<td>3-6</td>
<td>Normal</td>
</tr>
</tbody>
</table>
Regression of the Corpus luteus through a luteolytic agent

<table>
<thead>
<tr>
<th>Used product</th>
<th>Method of administration</th>
<th>Species</th>
<th>Refractory period of the cycle (days)</th>
<th>The onset of oestrus (days)</th>
<th>Fertility</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGF$_{2\alpha}$ or one of its synthetic analogs</td>
<td>single injection</td>
<td>Bovines, Sheep, Swine, Horses</td>
<td>1-6, 1-4, 1-12, 1-5</td>
<td>2-7, 2-4, 2-5, 2-7</td>
<td>Normal, Low, Not used Normal</td>
</tr>
</tbody>
</table>

*P* - progesterone;  
*OV* - Estradiol valerate (Oestradiol valerate);  
*MAP* - medroxyprogesterone;  
*FGA* - fluorogeston acetate (Fluorogestone Acetate)
<table>
<thead>
<tr>
<th>Activity</th>
<th>Recommended hormones</th>
<th>Effects</th>
<th>Species</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberation of GnRh from the hypothalamus</td>
<td>Estradiol</td>
<td>Liberation of GnRH</td>
<td>Bovines</td>
<td>Anovulatory estrus in some animals</td>
</tr>
<tr>
<td>Liberation of LH/FSH from hypothalamus</td>
<td>GnRH or one of its synthetic analogues</td>
<td>liberation of LH and FSH</td>
<td>sheeps, mares in anoestrus, cows post-partum, pre-pubescent females</td>
<td>Requires pulsatile administration for 2-5 days. Some animals have short luteal phase. Estrus is not present in all animals.</td>
</tr>
<tr>
<td><strong>Direct action on the ovaries</strong></td>
<td>(a) LH/FSH</td>
<td>Follicular growth, ovulation</td>
<td>all species</td>
<td>It is expensive and the needed compounds are difficult to obtain needed</td>
</tr>
<tr>
<td></td>
<td>(b) eCG</td>
<td>Follicular growth</td>
<td>Swine, sheeps, cattles, pets</td>
<td>Not effective in mares. Oestrus erased. It may require administration of progesterone</td>
</tr>
<tr>
<td></td>
<td>(c) eCG+ hCG</td>
<td>Follicular growth, ovulation</td>
<td>Swine</td>
<td>There is none</td>
</tr>
<tr>
<td>Mimics the ovarian cycle by administering: progesterone + gonadotropins</td>
<td>Progesterone / progestogens + CG + GnRH</td>
<td>Action on the uterus and the encephalon</td>
<td>Cattles, sheeps, horses, goats</td>
<td>Requires proper nutrition. Long enough post-partum period</td>
</tr>
</tbody>
</table>
Anterior pituitary gonadotropins
LH and FSH are glycoprotein hormones, with MW = 28-32 kDa, consisting of a carbohydrate fraction of 15-25%.

**LH uses:**
- ovulation induction in mature follicles,
- luteinization of follicular cysts,
- follicular growth and ovulation induction,

**FSH uses:**
- are rare:
- increasing the number of oocytes obtained from cows treated in order to induce superovulation by increasing ovulation rate in sheep, cattle and pigs.
FSH (follicle stimulating hormone)
- stimulates testicular development = helps spermatogenesis,
- as well the ovaries, in particular, the maturing of Graafian follicles.
- Ovulation can not exist in the absence of LH.

LH (luteinizing hormone)
- in males elaboration of testosterone,
- in females, release of folliculin = ovulation (in the presence of FSH), after which completes the process of luteinizing.

Besides the natural pituitary gonadostimulines which acts for a short time, in this group it cab also be included:
- extra pituitary gonadotropins produced by the placenta during gestation (luteinizing factor) or
- other glandular structures, in this case being extracted from urine or serum of gestant females.
**Gonacor (Pregnyl, Glanduantin)**
- containing lyophilized chorlogonadotropic hormone, derived from the urine of pregnant females.
- stimulates the development of male genitalia through increased androgen secretion and, the female genital apparatus, by extending the luteal phase.
- in: anovulatory estrus, ovarian cysts, hipogalaxie, nymphomania.

**Prolan**
- extra pituitary preparation with gonadotropic hormone from the urine of gestant females until the 3rd month of gestation.

**Prolan E**
- vials from 1 to 10,000 I.U., having in addition high concentrations of LH and an addition of 30mg/ml vitamin E.

**Prolan S**
- vitamine E substituted with estradiol benzoate.
Praedyn
- contains: chorionic gonadotropin.
- stimulates ovulation and transforms follicles in corpus luteum and a follicle stimulating component FSH that will induce maturation of follicles and installation of oestrus.

Pregnant mare serum gonadotropin (P.M.S.G.)
- contains FSH produced by the placenta at 40-120 days of gestation.
- s.c. in: anafrodisia, anovulatory erased estrus, in hens for stimulate laying.

Serigon
- lyophilised powder, derived from P.M.S.G.

Folligon
- gonadotrophin, stimulating the gonads in males and females,
- develops follicles, stimulates spermatogenesis in males.
ACTH (Adenocorticotrop, Corticotropin, Procortan)

- rol în stimularea corticosuprarenalei care secretă cortizon.
- în: artrite, tenosinovite, furbură, acetonemie.
- măresc excitatibilitatea SNC, Induc hipertensiune sanguină (datorită reținerii clorurii de sodiu în țesuturi, ca urmare a secreției de mineralocorticoizi).

Cortrosin depot (Sinachten Depot)

- synthesis polypeptide, of 24 amino acids of human ACTH.
- activity for 24 h due to zinc phosphate which it contains.
- is administered i.m.
Post pituitary gonadotropins
Containing oxytocin stimulates the uterus through contraction and vasopressin (pitressin) with role in stimulating vascular muscles, with the exception of renal vessels.

*Acts as antidiuretic.*

**Antidiuretin (Desmopressin)**

- synthetic analog of natural ADH.
- produces long lasting effect,
- used in diabetes insipidus, through nasal installation.
**Oxytocin (Pitocin)**
- predominant action on the uterus which it stimulates in the latter part of gestation before calving.
- a synthetic analog product is Oxytocin S (Syntocyna).
- stimulating effect on the uterus, fast-acting.

**Presoxin (glanduitrin)**
- aqueous posterior pituitary extract,
- containing oxytocin and vasopressin
- in: egg retention, in dose of 1ml/hen and uterine prolapse.

Contraindicated:
dystocia through excess volume and pregnant animals.
Adrenal (suprarenal) preparations
**Adrenaline**
- secreted by the adrenal medulla.
- the adrenal cortex develops corticoids,
- most representative: corticosterone and cortisol type glucocorticoids, deoxycortisol (mineralocorticoid) and ketosteroid compounds.

**Glucocorticoids**
- as: antiphlogistic, antianaphylactics, antirheumatic, antihypoglycemic, in: acetonaeemia, laminitis, ophtalmias.

**Cortisone acetate (Cortisone)**
- crystalline powder, white, odorless, amorphous,
- water-insoluble. Is officinal. It is kept in Separanda.
**Hydrocortisone**
- White crystalline powder, odorless, bitter, insoluble in water.
- Is officinal.

**Other products:**
*Hidrocoron, Cortisol, Synthacort, Dermacortin.*

**Bixtonim**
- Containing 2% hydrocortisone, ephedrine, naphazoline.

*Coricit* - Ophthalmic ointment with cortisone and bacitracin.

It is used in allergies, arthritis, acute adrenal insufficiency, cardiovascular collapse.

**Prednisone (Supercortil, Contarcyl, Ultracorten)**
- Crystalline powder, yellowish-white, tasteless becomes bitter,
- Insoluble in water, officinal.

*Prednisolone acetate* is also known.

*As*: antiinflammatory and antiallergic,

*In*: rheumatic arthritis, myositis, lung disease, ophthalmia.
Prednisolone (Supracortizol, Hostacortin H)
- crystalline powder, white, odorless, tasteless, bitter, insoluble.

Superprednol (Decadron, Milicortene, Dexametason)
- administered orally and by injection
- in: rheumatic diseases, rhinitis, laryngeal edema, urticaria, eczema, toxaemia, acetonaemia și oftalmologie sol. 1‰.

Triamcinolon (Volon, Kenacort)
- synthetic glucocorticoid like superprednol.
- It has anti-inflammatory and antiallergic action.

Fluocinolon
- fluorinated glucocorticoid,
- action: anti-inflammatory, antipruritic, antiallergic.
Mineralocorticoid

- Influences: hydroionic metabolism of the body,
- retain: sodium, chlorine and water.
- most important for veterinary medicine.

Mincortid (DOCA, Decorten, Cortenyl)

- white powder, odorless, tasteless, almost insoluble in water.
- synthetic mineralocorticoid with no glucocorticoid action.
- The basic action = water and electrolyte metabolism.
- promotes retention of sodium, chloride, water,
- enhances the excretion of potassium.
- role in: disordered hydroionic metabolism correction,
- in: renal failure, hypertensive activity.
- in: surgical, traumatic or obstetric shock.
Antidiabetic products
Insulin
- is produced in the pancreas, has a polypeptide structure,
- intervenes in glucose metabolism,
- favors the formation of glycogen,
- inhibits the hyperglycaemic effect of anterior hypophysis.
- lowering ketonemia and restore acid-base balance.

Insulin-novo
- 10 ml vials containing insulin extracted from the pancreas of pigs
- different from human insulin by the last amino acid of chain B

Kombinsulin
- vials of 400 I.U. containing purified porcine insulin.

HG-Insulin
- vials of 10ml or 400 U.I.

Isophane zinc-insulin
- slowest action.
Antidiabetic sulfonamides

**Daonil, Glurenorm**

- Activity is based on beta cell stimulation.
- In the case of severe insulin-induced hypoglycemia, glucagon is used.
- Hyperglycaemic pancreatic polypeptidic hormone produced by alpha cells.
Thyroid and thyrostatic preparations

- 20% of the organic iodine from the body is in the thyroid gland, although the gland represents very little of bodyweight (0.02%).
- Iodine - vital to the functioning of the thyroid, because it enters into the composition of thyroxine and diiodtyrosine, having other role in metabolism.

**Thyroxine**

- First extracted from thyroid, later, synthetically produced.
- In: hypothyroidism in parenteral or oral administration.
- As: stimulating cell metabolism, correcting the glucidic and hydric ones, thyroid insufficiency, myxedema, delayed psychomotor development.

**Triiodothyronine**

- Amino acid of the thyroid which has an iodine atom least.
- The commercial preparation: Tiroton - intervenes in tissue metabolism and water balance.
- In: thyroid insufficiency, cretinism, obesity, myxedema.
Tyreton
- mixture of triiodothyronine and levotyrosine.
- effective in hypothyroidism.
- hyperthyroidism can be removed by thyrostatic substances, which are thioureia derivatives.
- radicalul tiroreic inhibă secreția de hormon tiroidian.

Methylthiouracil (Alkirol)
- is used in Basedow's disease and in thyrotoxic adenoma.
- used for fattening pigs and poultry.

Carbimazole (Neomercazole)
- very active thyrostatic, hindering the formation of the hormone,
- decreases basal metabolism.
Androgenic substances
Testosterone

originally obtained from testicles (today is synthesized).
formation occurs in the testicles
is based on a adrenocortical origin hormone.
provides: sexual instinct, stimulation, development and functioning of the male genitalia,
responsible also for secondary sexual characters.
in: impaired testicular function, attenuates trophic, vascular and not least nervous disorders occurring after the impairment.
in VM is rarely used,
in females the hormone has = inhibitory effects (estrogen antagonist).
in: hyperfolliculinaemia, galactorrhea, cancer, especially breast carcinoma.
for the regulation of the ovarian cycle when is combined with estradiol.
most used testosterone: testosterone enanthate = has long action through the release of gonadotropins.
facilitates the maturation of follicles,
helps ovulation and oestrus installation and last but not least helps the luteinizing process.
Fecundan
- contains testosterone enanthate and estradiol combination.
- for gestation diagnosis after 10-15 days from insemination in cows and gestation diagnosis in sows.

Gravignost
- same composition, for gestation diagnosis of young sows.

Testolent
- containing testosterone propionate and phenylpropionate action 3 weeks.

Androgens are also anabolic compounds:
The most common is Clostebol (steranabol).

Madiol
- in anorexia nervosa, the doses are virilizing the females.

Dianabol (naposin) = the strongest anabolic.

Elimination of testosterone, through urine as androsterone.
Estrogenic substances
Folliculin (estadiol dihydrofolic)

- produced by De Graff follicles,
- removal, through urine as estrone.

Stimulates:

- sexual organs and the secondary characters in females;
- participating in the function and maturation of follicles, thus in ovulation.
- in females - determines the appearance of oestrus,
- in males - inhibits sexual function and testicular atrophy.
- in general, estradiol esters are used.
Ginosedol B
☑️ is estradiol benzoate.
☑️ i.m. administration,
☑️ in: hypofolliculemia and prostate hypertrophy.

Ethinyl estradiol (Lynoral)
- the most appreciable androgen antagonist.

Other preparations:
Ovestrin (Oestriol);
Estrolent;
Presomen
Ambosex tablets used in hypophysis hyperfunction;
Estrotest - in hyperfolliculemia = inhibition of pituitary gonadotropin and neurovegetative imbalances correction
Synthetic estrogens

- distinguished from folliculin, but have similar properties.
- the most effective antagonists of male sexual hormones,
- hormonal castration of boars and males of bird species.
- can also be used in treatment of testicular tumors.

Sintofolin (Synestrol, Oestrasol, Diacetilhexestrol)
- white crystalline, odorless powder, insoluble in water.
**Diethylstilbestrol (Distilbene)**

- Crystalline, yellowish-white, odorless powder, insoluble in water.
- Is used in the form of tablets, but there is also an oil solution Cyren B, a dipropionate ester in a concentration of 0.1 to 0.5%.
- In: hypogonadism, vaginitis and prostate adenoma.

**TACE (chlortrianiisene)**

- Complicated chemical structure.
- Estrogen synthesis, effective p.o., lasting effect.
- In: prostate cancer and in female hypogonadism.
Gestagen substances (progestogen)
Progesterone (Progestin, Lutocor, Luteosteron)

- white crystalline powder.
- role to prepare the myometrium \textit{pentru nidațle},
- essential in maintaining \textit{gestation},
- in preparation of the \textit{mammary gland} for the upcoming lactation;
- prevents ovulation and heat (antigonadotropic effect).
- high doses causes masculinization of the female fetus.
- \textit{in: nymphomania, follicular cystic degeneration, anafrodisiac},
- \textit{in: combating infertility (due to insufficient corpus luteum)},
- for \textit{synchronization of oestrus in sheep}.
Hydroxyprogesterone acetate
- synthesis product with more energetic activity.
- oestrus synchronization.
commercial products: Gestafortin (Clormadion), Bovisynchron.
Medroxyprogesterone (Farlutal)
- synthetic derivative, progestational activity,
- used to synchronize oestrus).
Orgametril
- used in the endometritis metrorrhagia),
Gestanon (Turinal)
- placentotrop which ensures the continuity of gestation.
Depostat
- very effective antigonadotrop in prostate adenoma.
**Suisincron**
- preparation coupled with zinc metalibur
- acting on the erythrocyte sedimentation rate (ESR).
- p.o. to sows for 20 days, in the 5th or 6th day = ovulatory estrus

**Metalibur**
- more toxic antigonadotrop.
- some progestational synthetic derivatives, in combination with estrogens,
- in low, but frequent doses,
- suppresses follicular maturation and ovulation in females.
- Commercial product Norlestrin (Non-ovulon).

**Lutestan (Testolutan)**
- results in inhibition of pituitary gonadotropin and simultaneously protect the lining of the uterus from estrogenic activity.
- i.m. in hyperfolliculism.
Parathyroid preparations
**Parathyroid hormone**

- has not been yet shown in the pure state,
- parathyroid extracts may be used that are effective in hyperparathyroidism.
- this shows that the hormone exists in a high titre.

**Parathormone**

- parathyroid gland extract
- favorable activity in parathyroid hypofunction.
- in hypocalcemia, hyperphosphatemia, tetany, spasmophilia.
- in tetany counteract the effect is quite slow.
Epiphyseal preparations
Epifizan

- Antigonadal activity and weak inhibitory of the thyroid.
- In substitution treatment in: hypo-epiphyseal syndrome (macrogenitosomie), hyperfolliculinamia, prolonged estrus, uterine fibroma, estrogen metrorrhagias, false gestation and lactation in bitches,
- As adjunctive: hyperthyroidism, growth disorders.

**Thymic preparations**

- Good stimulant of growth and sexual maturation.
- It is recommended in growth disorders, infantilism, dystrophies.

**Leucotrofina**

- Has two variants: p.o. 20% and injectable 1:50.
- In: leukopenia, best stimulant for leucopoiesis.
Prostaglandins
were discovered in America in the 30s.
are substances which belong to the lipid group.
encountered studying the sperm activity on the uterus.
first crystallized and purified prostaglandin and their first separation took place in the 60s, when the first groups appeared: E and F.
about 23 natural prostaglandins are known, which were classified into the groups: A, B, E and F.
and synthetic formulas called: prostanoids.
Mode of Action

- active in the body from the level of pico or nanograms.
- those from seminal fluid causes local vasodilation,
- stimulates sperm motility,
- produce: ovarian luteolysis,
- contracting uterine muscle fibers = oxytocic effect, especially in the case of PGF 2-alpha which may interrupt pregnancy.
- in: high blood pressure PGA and E, arrhythmias PGE1, ulcer disease, tromboembolism.

PGF-2alpha (Enzaprost, Oestrophan)

- in animal husbandry,
- luteolytic role and
- role in smooth muscle contraction.
Lutalyse (Dinoprost)
- synthetic product of PGF-2alfa, crystalline, 10ml vials of 5%.
- is administered i.m. to cattle, horses and pigs.
- induces regression of the corpus luteum and
- stimulates bronchoconstriction and smooth muscle.
- to control oestrus and ovulation in cattle and horses,
- in chronic metritis, pyometra in cattle, for managing reproduction

Estrumate
- synthetic prostaglandin analog, related to PGF-2alfa.
- high potential luteolytic for cattle.
Other endocrine products
Endorphins

- peptide secreted by encephalon, called enkephalins.
- synthesis: neurons in the caudate nucleus, hypothalamus, pituitary and other adjacent nervous formations,
- strong analgesic action, opiate-like
- hormones moderators: vasopressin, oxytocin, prolactin

Interferon

- lipoprotein structure, of aglandular tissue nature.
- one of the best antiviral factors and inhibitors of cell proliferation, being a virtual drug against virus proliferation and certain neoplasms.
Vitamins
exogenous biocatalysts,
important role in nutrient exchange.
do not have nitrogen in their structure, so they are not amines.
they are known 14 vitamin structures, some synthetic.
in: hypo and avitaminosis, correcting metabolic disorders through their participation in oxido-reducing processes,
specific activity of coenzyme, by synergistic or antagonistic action to hormones.
the best known classification is by their solubility:

**Liposoluble vitamins**
- they are absorbed from the intestine together with fat,
- deficiencies of these vitamins are manifested delayed,
- reserves of these vitamins are found in the liver.

**Hydrosoluble vitamins**
- usually from exogenous sources,
- can coexist with soluble vitamins,
- their deficiency is observed immediately.

**Toxicity of vitamins**
- generally low.
- the liposoluble ones, by cumulation, overdose = toxic effects.
- hydrosolubles, due to elimination, do not generate harmful actions.
Vitamin A

- Retinol,
- antiinfectious vitamine,
- Antixerophtalmia vitamin,
- Growth Factor,
- Mucosal and epithelial protecting factor
Officinal form = acetate, oily solution, or mixture of yellow-orange crystals, with characteristic odor and taste, and contains 950 U.I./g.

The precursor is carotene.

Carotene is biologically inactive, but in the body, influenced by hepatic carotinase and in presence of thyroid hormone = activated vitamin A.

It will be stored in the liver as a form of deposit.

Deficiency = trophic disorders of the skin, visual disturbances, especially at twilight - hemeralopia, xerophthalmia (vitamin A is a component of the retinal purpurea).
Hypovitaminosis A followed by growth disorders, sterility and generally pronounced decrease of the body's resistance against bacterial aggression.

Vitamin A role in:
- **normal** development of epithelial cell metabolism,
- height and weight growth,
- conducting metabolic processes of sexual steroids and glucocorticoids,
- role in the dynamics of redox processes.

- In: growth period, gastroenteritis, catarrhal pneumopathies, coccidiosis, lactating and gestating females, laying hens, eye disorders, infectious diseases, eczema, burns, frostbite, hyperthyroidism
- vitamin A is **antagonistic to thyroxine.**
Conditionings: capsules, dragees, vials of 1 and 5 ml, drinkable solutions with 30,000 I.U. and ointments 20 g tubes of 1,000,000 I.U., aqueous injection products of 400,000 I.U., 50, 100 ml bottles.

Hydrosoluble vitamin A = palmitate form, prepared ex tempore, not maintained from one day to another.

to: laying hens and broilers, youngsters of other species.

locally: skin and mucosa.

Oleum jecoris

- fatty oil, purified by cooling to 0°C.
- contains at least 850 I.U./g, vit. A + 1/10 p. of I.U. vitamin D/g.
- light yellow, smell and taste of fish.
- p.o., doses: 100 g, up to 1 cg.
- in composition of Jecolan and of Jecozinc
- externally in skin ulcers, burns, frostbite.
The association of vitamin A + D2 (Vitol) which contains 300 I.U. vit. A and 1000 I.U. vit. D$_2$


In: osteomalacia, osteoporosis, rickets, fractures.

**Vitamin A-E**

- Injectable vials of 500,000 I.U. vit. A and 0.25g vit. E.
- In: combating infertility and abortion prevention.
- S.c., i.m.: 8-10ml. Repetition are made at 3-4 days, 2-3 times.
- Most effective commercial associated compound is vitamin AD$_3$E (Ursovit, Turlin, Trigantol).
Vitamin B1
- anti beri-beric,
- antineuritic,
Official name = thiamine.

- *Hidrosoluble, hydrochloride* being the officinal.
- White, crystalline, odorless, bitter, water soluble powder.
- It is obtained, also, synthetically.
- In the body, by esterification with pyrophosphoric acid = active form involved in the metabolism of sugars.
- Essentially facilitates decarboxylation of pyruvic acid.
- In vitamin B1 deficiencies, pyruvic acid is not metabolized, accumulates in the tissues, giving paresis related disorders, polyneuritis, fatigue, paralysis.
Vitamin B₂

*riboflavin,*

*actoflavine,*

*betaflavine*
crystalline, yellow, faint odor, bitter taste powder, sparingly soluble in water, officinal.

in yeast, alfalfa grains sprouts, egg white, liver.

in the body is activated by phosphorylation, favorably interfering in the metabolism of: carbohydrates, lipids and proteins.

in the composition of yellow respiratory ferment, what plays a role in cellular respiration of tissues that lack vascularity (cornea, crystalline), role in hematopoiesis and visual function.

deficiency = photophobia, skin lesions, headache, hemeralopia

in: therapy of stomatitis, seborrheic follicular keratosis, dermatitis, conjunctivitis.
Vitamin B₆
pyrldoxine,
benadon,
adermin,
hexoblon
crystalline, white, odorless powder, slightly sour taste.

In the body, phosphorylated form,

intervenes in various enzymatic processes,

can be an integral part of some the enzyme.

role in the metabolism of fats, favoring their synthesis from unsaturated fatty acids,

role in: metabolism of proteins (tryptophan),

activator: of trophicity of skin and nerve cells.

in: haematological, dermatological disorders, polyneuritis, dystrophies, convalescence.

vials of 1, 2, 5ml, 2.5% or 5% solution and tablets of 0.25g
Vitamin B₉

اصة acid
White, crystalline powder, almost insoluble in water.

In: barley, spinach, liver, brewers yeast.

is obtained synthetically.

composed of 3 groups:

pteridine,
paraaminobenzoic acid and
glutamic acid.

Maintains constant the number of erythrocytes, their volume and percentage in hemoglobin.

In addition it stimulates: leucopoiesis and protein synthesis.
Para amino benzoic acid

- Paraminol,
- Vitamin H1
- PABA
crystalline, white to yellowish powder, slightly sour, bitter,
low water solubility, is officinal.
is an **antisulfonamidic factor**, 
role in: maintaining cutis, appendages
deficiency = hair depigmentation.
in: diseases of the skin, disorders of hair trophism.
- **water-soluble vitamin, officinal.**
- **red crystalline powder, or under odorless, tasteless crystalline form.**
- **Although hygroscopic, is slightly soluble in water.**
- **Has antianemic activity.**
- **Antianemic factor in liver = eriteine is derived from a:**
  - **Dietary extrinsic factor: vitamin B₁₂ and**
  - **An intrinsic factor from the gastric mucosa: apoferritin.**
- **It is produced also by fungi from Streptomyces family.**
- **In: toxoinfectious anemia, nutritional and nervous disorders, hepatitis (role as lipotropic factor), cirrhosis, after hemorrhages.**
Other representatives of the group B
Vitamin H (biotina, Murnil)
- from the B complex, an optically active organic acid (dextrorotatory), needlelike crystals, colorless, slightly soluble. Salt is officinal.
- in: metabolism of amino acids, stimulates the skin and appendages resistance.

Vitamin B₈ (inositol, Tonozid)
- a hexa-dihydroxy hexane, with 8 isomers, of which only mesoinositol is optically active.
- lipotropic action, hepatoprotective.
- in progressive muscular dystrophies, in hypercholesterolemia.

Vitamin B₁₅ (pangamic acid)
- activity: antitoxic, lipotropic.
- decreases the body's sensitivity against secondary actions on ethyl alcohol, opiates, barbiturates, antibiotics.
Vitamin PP
(nicotinamide, Nicobion, nicotinic acid, Bepella)

- amide of nicotinic acid, (acid has the same role as the vitamin).
- colorless crystals, or yellowish-white powder, odorless, bitter.
- also called pellagra preventi. Store at Separanda.
- in: tomatoes, liver, milk, yeast, fungus.
- role in: metabolism of carbohydrate, lipids, proteins.
- redox catalyst,
- enhances the formation of thrombokinase,
- vasodilator, hypersecretion,
- hypermotilizant for the stomach and intestine.

deficiency in:
- dogs = black tongue disease,
- pigs = gastrointestinal disorders,
- birds = dermatitis.

used in: erythroderma, eczema, stomatitis.
**Pantothenic acid** (anti-dermatitis factor)

- present in the B complex,
- optically active compound, the dextrorotatory component.
- oily appearance, unstable, therefore Ca salts are used.
- are part of coenzyme A.
- prevents exudate in chickens and rats, growth-enhancing.
- commercial: *Pantothenol, Calcium pantothenate*, vials of 2ml 2.5% and 5ml 10%.

**Brewery yeast** (*Faex medicinalis*)

- fungus from *Sacharomyces cerevisiae* family.
- contains all the vitamins from B complex, in fresh form
- remedy in uterine infections, in dry form (*sicca*) is characterized by plastic properties,
- **In:** rickets, furunculosis, doses 5 times smaller than the fresh one.
**Complex B (Poly B)**

- vials of 2ml aqueous injectable solutions, with: vitamin B₁ 0.01g, B₂ 0.02g, B₆ 0.006g, nicotine 0.05g, water ad 2ml.
- good general tonic in: states of exhaustion, ophthalmology.
- it is administered i.m., in cures of 5-10 days.

**Complex B forte (Pyvital)**

- contains: vitamins B₁, B₂, B₆, nicotinamide, calcium panthotenat, yeast extract.
- strong general tonic, twice as strong as Complex B.

**Vitamin F (Linomag, Linosan, Linocilin)**

- concentrate of ethyl esters of unsaturated fatty acids.
- role: maintaining skin trophicity, in lipid and cholesterol metabolism, in the endocrine mechanism of ovulation and growth, in the treatment of burns, wounds, acne, seborrhea, hyperfolicullinemia.
Vitamin C

- antiscorbutic vitamin,
- Vitas scorbol,
- Ceblon,
- Ascorbit,
- Redoxon
vitamin which contains ascorbic acid; is officinal.
synergistic activity with adrenal hormones and with vitamin B₂.
can be antagonistic with: thyroxine and vitamin A.
hypovitaminosis C in animals is rarely seen.
vit. C deficiency leads to: decreased resistance to effort and exogenous noxious agents, onset of haemorrhagic diathesis.
adjuvant in: infectious diseases, lung disease, intoxications, hemorrhagic condition, convalescence, fractures.
Vitamin P
(Rutin, Rutozid, capillary permeability vitamin)

- flavonic glycoside,
- fraction found with ascorbic acid in some herbal drugs: lemon, hawthorn, black currants, walnuts, buckwheat leaves etc.
Vitamin D
- antirickets vitamine
In vegetal regn = vitamin D₂
> is formed from ergosterol under the influence of U.V. radiations
> in animal regn = vitamin D₃ (dehydrocholesterol), in the skin, under the influence of U.V.
> both the first form and the second are officinal.
> in the body: vit. D ensures Ca resorption in the intestine in the form of phosphates and assimilation in that form in bones and teeth.
> stimulates transformation of inorganic phosphorus substances to organic compounds, restores Ca/P ratio.
> when the ratio is disturbed, following deficiency = rickets and osteomalacia, Ca being diminished from bones 50-75%.
> hypovitaminosis = in all categories of youth, in lactating and gestating females, in general in animals that are exclusively in stabulation and in the dark.
> in: hypocalcic osteopathy, tetany, spasmophilias.
Vitamin E
antisterile vitamine,
tocopherol,
fertiol
liposoluble, officinal, as acetate, viscous, yellow, clear solution. In: green leguminous plants, embryos of grain, cottonseed oil, from which the beta and gamma tocopherols were extracted, in pork lard, in the anterior pituitary gland, placenta, egg yolk. Nowadays is prepared exclusively by synthesis. Synergistic with selenium, protects membrane and organelles from harmful processes, in: prevention of embryonic death, abortion, myopathies, white muscle disease, encephalopathies in foals and calves.
Vitamin K
- antihaemorrhagic
liposoluble.

in: spinach, cabbage, tomatoes, nettles, pork liver, eggs, milk.

in animal regn = *fitomenadion (vitamin K₁)* synthesized by intestinal flora of mammals, in these hypo- or avitaminosis is not met.

deficiency: common in birds (haemorrhagic diathesis).

1% solutions, and the synthetic product = vitamin K₃ (*menadione*).

drinking or injectable solution in vials of 1 - 10ml 10%.

**Vitamin K₃**

is absorbed only in the presence of bile,

the hydrosoluble form is absorbed in its absence too.

in: haemorrhagic diathesis, haemorrhages, hypoprothrombinaemia in birds, adjuvant in the treatment of coccidiosis, drinking solution.

long acting.

can increase capillary resistance,

**Vitamin K₁**

- rapid hemostatic effect, s.c. and i.v.
Folks, thank you for your attention!

http://www.mytimeoutstudio.com/Portals/32393/images//another%20crazy%20woman.jpg

http://www.supercoolpets.com/pictures/won'thappenagain.jpg