

Artificial Insemination

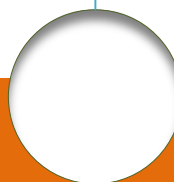
Insemination of horses





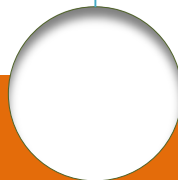
INTRODUCTION

- Insemination = fertilization of mare with fresh sperm or short(long)-term preserved sperm
- 3 phases: sampling of sperm
 - treatment of sperm
 - insemination of mare
- Selection according to efficiency is more important than fertility at horses
- Fertilization ability of stallion's sperm besides depends on different size of sperm's head of stallion
- It cannot be used in stud of Arabian thoroughbred



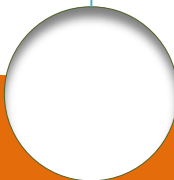
History of horses' insemination

- First insemination of mares was carried out at the end of 19th century
- It was used as a model at development of insemination of other types of livestock
- First in Central Europe, the Soviet Union and Balkan countries → elimination of stallions' infection
- However, it was accepted after World War II due to increasing interest in sport horses and racehorses



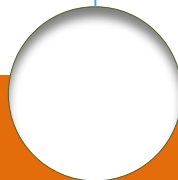
Advantages of horses' insemination I.

- It enable fertilization of mares that cannot be fertilized by stallion
- Spread of venereal and other infectious diseases is reduced
- No need of transport, lower risk of potential injury and stress
- Quality of insemination dose is tested
- Possibility to achieve higher percentage of pregnancy
- Development of business with stallions' sperm



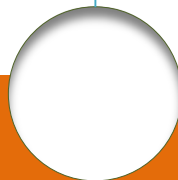
Advantages of horses' insemination II.

- **During insemination with frozen sperm:**
 - **We use sperm of stallion even if it does not live**
 - **We create sperm bank**
 - **We use stallion's sperm in time when semen cannot be frozen**
 - **We use top stallions on an international scale**

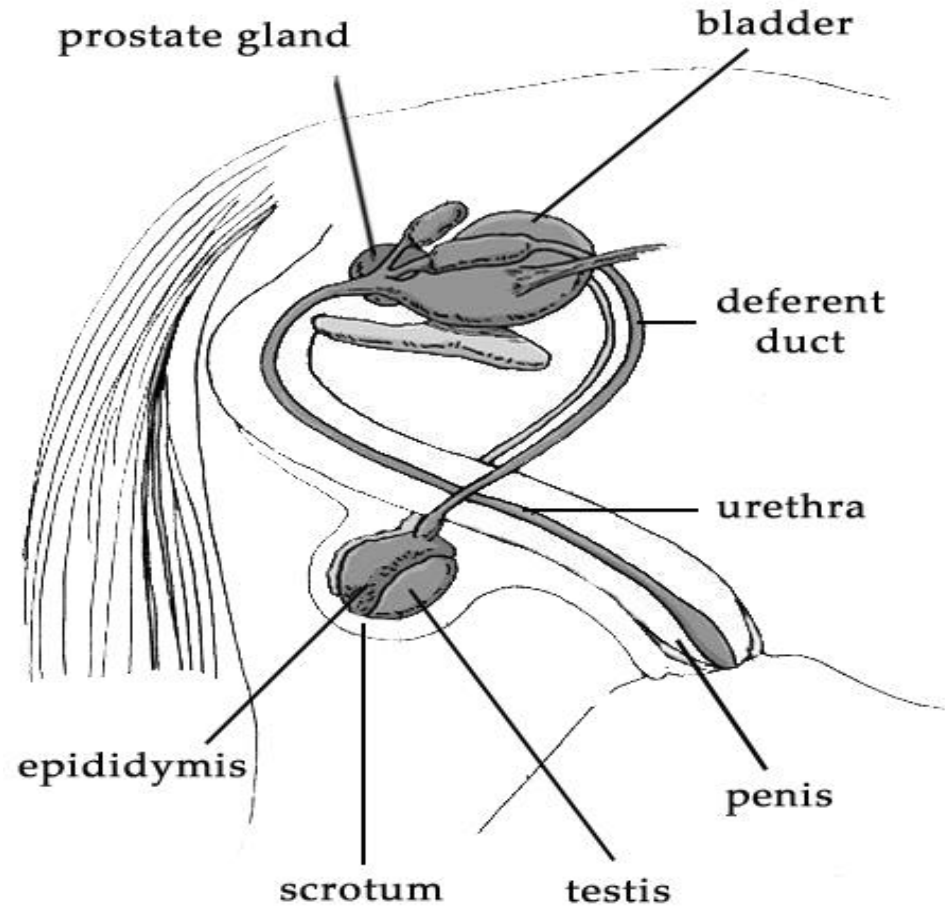


Selection of stallions for insemination

- It must be healthy
- Genitals must be properly developed
- It must show good libido sexualis
- It must have good quality of sperm after sampling, dilution and conservation
- It must be well controllable
- We usually put into reproduction stallions at the age of 3-4 years and it depends on the way of its using

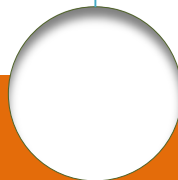


Anatomy of genitals of horses - Male's genitals



Sampling of sperm

- Into various types of artificial vagina, the best temperature at sampling is 40-42°C
- Adequate pressure is necessary
- The best results are achieved at presence of mare in heat
- Penis should be regularly treated and disinfected (by lukewarm solution of acriflavine, 2 hours before sampling), washed (sedimented salts on penis, smegma – sebum from foreskin)
- Sampling once a day in breeding season, optimally 2-3 times a week



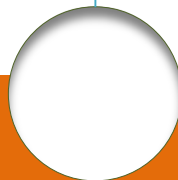
Sampling of stallion's sperm



<http://www.thehorse.com/articles/31267/cheap-n-easy-method-for-evaluating-stallion-sperm-described-aaep-2012>

Qualities of stallion's ejaculate

- Cubic capacity: 50-200 ccm³
- Colour: white, grey and white
- Consistency: watery
- pH 6.7 - 7.5 (7.8 – whole ejaculate was not taken)
- Concentration of sperms: 0,1 to 0,3 x 10⁶/mm³
- Activity of sperms: 60-80%
- Frequency of occurrence of pathological sperms: max. 30-35%

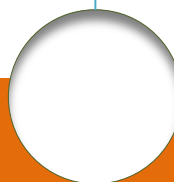


Insemination dose

- Name and state register of stallion
- Laboratory designation
- Date of sampling
- Short-term preservation:
 - cubic capacity 10cm³ of diluted sperm, 300x10⁶ sperms and their activity 60%
- Long-term preservation:
 - cubic capacity 10 cm³ of diluted sperm, 300 – 400x10⁶ sperms, their activity at least 30% and in 1cm³ up to 10000 nonpathogenic microorganisms

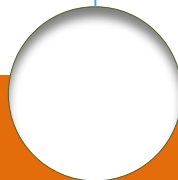
Short-term preservation of sperm

- Semen is kept at temperature 4 - 6°C, cooling down must be gradual
- For dilution we use most often: skimmed milk, glucose and yolk
- Fertilization ability for 24 - 48 hours
- Dilution ratio - 1:1, 1cm³ of diluted sperm must contain min. 20 million sperms with progressive movement ahead

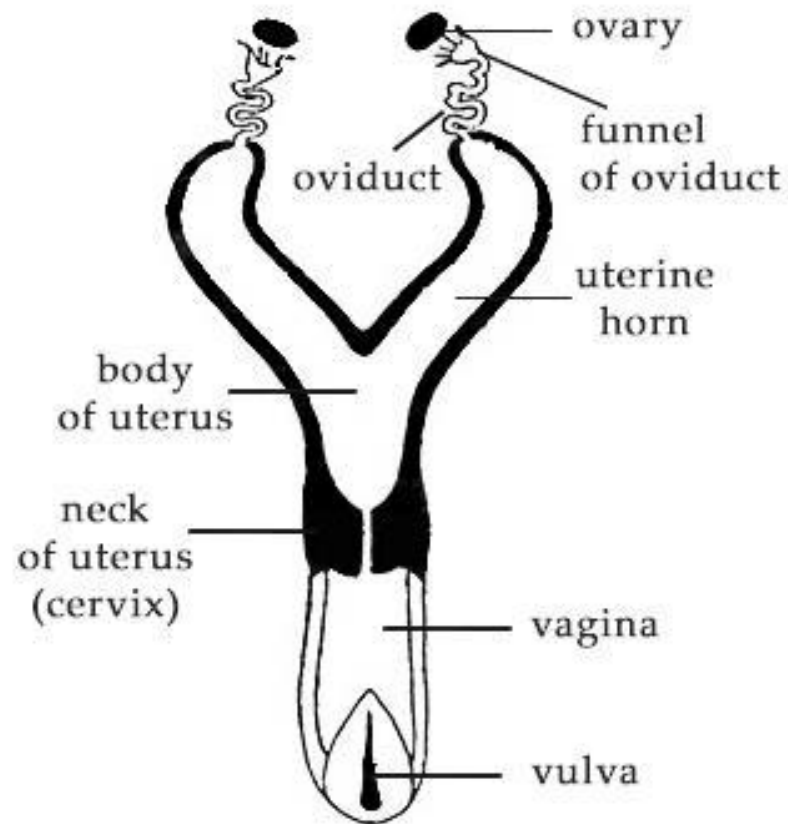


Long-term preservation of sperm

- Freezing into pellets
- For dilution we use skimmed milk (fresh or dried), glucose, potassium citrate, lactose, raffinose, sodium citrate, deionized sterilized water
- Equilibration, cooling to 4°C – it is given into pellets and frozen into nitrogen
- Defrosting: 10-20 seconds in water with temperature of 40-45°C

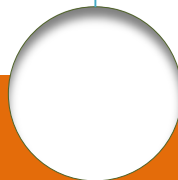


Anatomy of genitals of horses - Female's genitals



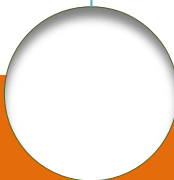
Insemination of mares I.

- It is carried out after finding out 3 signs of heat:
 - external signs (flashing, unrest)
 - opening of cervix
 - size of follicles
- Proper cleaning, especially tail, its fixation
- Washing around rectum and labia, on their inner side as well
- First of all technician prepares insemination dose which is preheated in water bath with temperature of 35°C



Insemination of mares II.

- Disposable glove – lubricity using vaseline or paraffin oil
- We can carry out insemination if 1-3 fingers fit into cervix
- Finger is inserted into cervix and pipette along it, about 10-15 cm from external gate of cervix
- Sperm is squeezed out during 15 seconds, we should stop air supply into uterus as much as possible
- Apply slowly

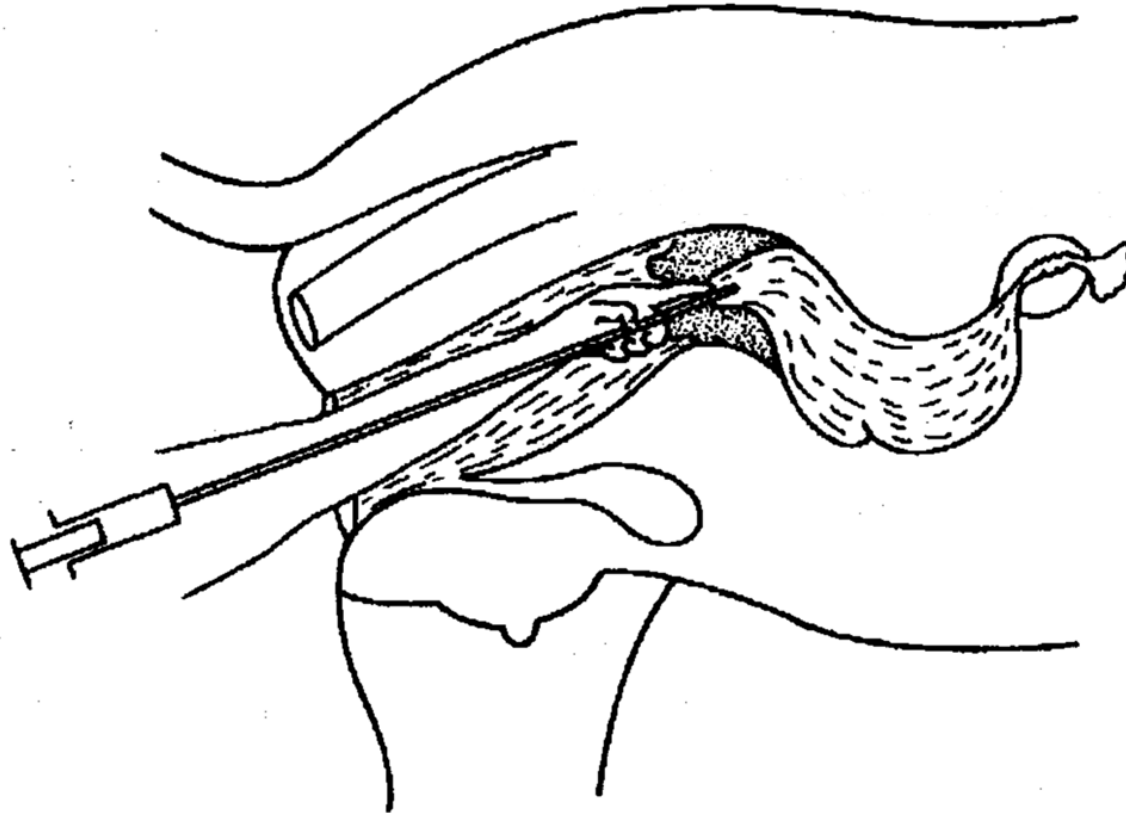


Insemination of mares III.

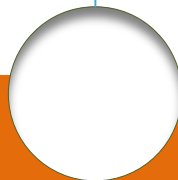
- After insemination we walk mare for 15min
- Insemination is repeated at interval of 48 hours to the end of heat
- Results of pregnancy – using palpation through the wall of rectum, cca 42nd day after insemination



Insemination of mare into cervix



THANK YOU FOR YOUR ATTENTION!



Bibliography

Aspinall, V. (ed.): The Complete Textbook of Veterinary Nursing, Elsevier
2011

Anatomie a fyziologie hospodářských zvířat, Praha SZN 1971

Kovář, V., Charvát, J., Šarudy, L.: Porodnictví a inseminace, Praha, SZN 1973

Popesko, P.: Atlas topografickej anatómie hospodárskych zvierat I,
Bratislava, Knihtisk 1960

Popesko, P.: Atlas topografickej anatómie hospodárskych zvierat II,
Bratislava, Knihtisk 1960