Pigs breeding and welfare

Reasons for breading of pigs

• Meat

• Bristles hair brushes, paint brushes

• Skin – leather products

• Works - Truffle search (France)

• (Manure)

Domestication

- Modern agricultural pigs have descended from the European wild boar (Sus scrofa)
- Pigs were first domesticated in the Near East around 8500 BC and subsequently brought into Europe.
- Domestication of the pigs was favoured by its social nature, adaptability and omnivorous habbits.
- Their basic behavioural instinct have been conserved.

Technology of pig breeding

- Rearing of gilts, dry sows, pregnant sows.
- Female pig from the perinatal period until weaning of the young (farrowing house).
- Rearing of piglets.
- Fattening of slaughter pigs.
- Breeding of breeding boars.

Gilts and sows breeding

- First estrus it is not advisable for insemination (mating).
- Estrus recurs after 21 days.
- Gilts are included in the breeding on the basis of selection.(Requirements: age 7

 8 months and weight of 130 140 kg, good body confirmation, estral cycle, the number of teats on the left and right side is ideally 7/7).
- Gilt The optimum period for insemination of gilt is at the 2nd to 3rd estrus. Sows are inseminated 10 days after weaning.
- Flushing- The sow's diet is increased by 50 100 % 10 days before insemination. Flushing improve estrus symptoms and releases more eggs.

BCS



Condition score 1:

The sow is visually thin, with hips and backbone very prominent and no fat cover over hips and backbone.

Condition score 2:

The hip bones and backbone are easily felt without any pressure on the palms.



Condition score 3:

It takes firm pressure with the palm to feel the hip bones and backbone.



Condition score 4:

It is impossible to feel the bones at all even with pressure on the palm of the hands.

Condition score 5:

The sow is carrying so much fat that it is impossible to feel the hip bones and backbone even by pushing down with a single finger. Estrus is characterized by behavioral and physical changes restlessness of the animals, aversion to eat, vocalizing, harassment of other animals - attempts to jump, external genital organs and mucous membranes of the vagina are reddened and sweeling, vaginal discharge...



Management of the gilt for breeding and in first gestation for longevity (nationalhogfarmer.com)

 It is important for breeders to detect the reflex of immobility during estrus - it is manifested by a rigid posture, a characteristic sign of the period of receptivity to mating. It can be tested also by boar who walks along the corridor between the housed sows twice a day after feeding, morning and evening for half an hour. A boar older than 10 months, which has already produced enough pheromone substance which stimulates estrus in sows. It's in the boar's saliva and urine. The touch test is only used in herds with small numbers of sows.

The farmer pushes on the sow's back with both hands or by sitting on her back.



• The insemination is performed in 10 to 12 hours after the reflex of immobility is detected, and reinsemination is carried out in a further 10-12 hours.



Detection of pregnancy

- Laboratory method is determination of the concentration of the hormone progesterone on days 17 - 21 (Expensive)
- Ultrasonography is performed from day 23. Ultrasound examination of sows is performed through the abdominal wall in the region of the groin, simply by placing the probe.
- Another estrus will not occur in a pregnant female.
- Pregnancy is repeatedly checked.
- Breeder can monitoring of external signs of abdominal distension in the higher stage of pregnancy.



Ultrasounding for Pregnancy Detection - Pork Information Gateway (porkgateway.org)

- Pregnancy in sows lasts 115 days.
- In the conditions of large farms, farrowing takes place in individual farrowing pens.
- Pregnant gilts and sows are washed a moved to the farrowing section a week before farrowing.

Sow housing technology

- It is one of the most demanding technological systems in pigs breeding.
- Successful breeding results are determined by:
 - the number of piglets reared per sow per year (Minimally 22 piglets reared per sow/year. Is required 2.2 2.4 litters per sow per year.)
 - their weaning weight
 - piglet balance and piglet vitality

Sow housing technology

- <u>Categories:</u>
- Sows not inseminated, in the period of insemination and early pregnant,
- o Pregnant sows (pregnant to about day 108 of gestation),
- Pre-parturition, farrowing and lactating sows (7 days before farrowing and from farrowing to weaning of piglets).

Housing

- Individual boxes this system is preferred especially in large farms where sow insemination is used.
- Ind. housing covers the period from the beginning of estrus to the detection of pregnancy
- The advantages of housing are a better overview of animal behaviour, feed intake, health and care.
- Disadvantages poorer estrus display and recognition, more labour intensive, sows have limited exercise during the period of insemination until pregnancy



 It is a combination of group and individual housing. Each sow has her own individual stall with the possibility of fixation, behind which there is a common area.

- Sows are group housed and they can move until estrus.
- The sows are fixed in individual crates from the beginning of estrus.
- They are kept here until pregnancy is established.
- The box pen is opened and they are allowed to move freely again.

Group housing

- There are usually 6 8 sows of the same age and approximately the same weight and in the same stage of pregnancy in one pen
- Advantage:
- Better stimulation and more pronounced estrus.
- Intolerant sows must not be kept with others in a group!
- Sows can be reared in traditional technologies on bedding, on deep bedding or without bedding (slatted floors).











Housing for pregnant, lactating and farrowing sows (farrowing house)

- Individual housing is used. Sows are transferred to an individual pen 7-10 days before farrowing, where their movement is limited by restraints.
- Purpose:

Significant reduction of piglet losses by sow.

The floor is fully or partially slatted, mostly without bedding. The pen equipment includes a trough and drinkers for the sow, a drop feeder, a drinkers and a burrow for the piglets.

The farrowing house is air-conditioned with a temperature of 21-22°C and a relative humidity of 75 %.

After weaning, the piglets are moved to the finishing room and the sows to the "farrowing room" where they await insemination.



Clean farrowings crate are prepared for pregnant sows.



Sows in farrowing crate with piglets.



Signs of impending parturition:

Characteristic weakness of the pelvic ligaments, the external parts of the genital tract become enlarged and vascularized, the sow is restless, frequently urinates and defecates, gets up and lies down.

The sow is not fed on the day of birth and must have access to water.

The feed ration is reduced according to the scheme 3-2-1-0

3 days before birth the feed ration is reduced by a quarter, two days before birth by half and the day before birth by $\frac{3}{4}$.

Treatment of piglets after birth

- Breeder checks pregnant gilt/sows before and during birth.
- Assistence is not required.
- But:
- If the piglet in the amniotic sac, remove it
- You have to clean the oral cavity and nostrils
- Umbilical cord is usually breaks, desinfect them
- You can attach the pig to the mammary gland.
- The piglets do not have developed thermoregulation after birth, so they need to be moved to a room where the temperature is 32-35 oC, the piglet room is heated either by electrically heating plates or infrared heaters, e.g. infralamp. Thermoregulation is developed at 21 days of age.

- Piglets that weigh less than 1 kg at birth are problematic. If they are not given extra care they starve to death. The optimum weight of a live-born piglet should be 1,3-1,6 kg.
- Newborn piglets are looking for a mammary gland. The first piglets drink during birth.
- Piglets from multiple litters can be removed from the sow and added to a sow with a less numerous litter.

- During the first days:
- The breeder or vet technician can pinching or grinding sharp teeth. They can use the emasculator and dock the tail.(Legislative requirement -only for therapeutic reasons)
- They castrate the males.

Piglets receive pellets from 5 days of age.

Methods of weaning piglets

- Weaning a piglet can be done at any age in the earlier weaning we have to provide the better the conditions!
- traditional weaning 56 days
- Shortened weaning 49 days
- early weaning 11-21-28 days max. up to 35 days
- early weaning 36-48 hours or 4-10 days
- Artificial weaning SPF weaning (caesarean section or hysterectomy remove the uterus piglets in an incubator, during recovery actions).

Housing systems

- Weaned piglets are moved from farrowing houses.
- Weaners, growers and finishers are bred in a stable groups.
- The most common method of housing is the litterless housing with plastic slats but housing on deep bedding can be used too.
- The optimum number of pigs in litterless housing is 10-20 piglets in and 30-40 piglets in deepbedding.



Feeding

- The fattening is carried out on the basis of complete feed mixtures A1 up to 35 kg, A2 for the weight category up to 65 kg and CDP (cereal pig diet) is fed until the end of fattening.
- Weaners and growers are feed at libitum. Finishers (65kg +) are fed 2 – 4 times during day.
- The feed mixtures are given in wet or dry consistency.
- Drinking water is provided by automatic waterers.

Breeding of boars

Breeding boars are used either in natural breeding or at insemination stations. Currently only 1/3 of the piglets are born after natural breeding.
Selection of boars for breeding - based on temperament, libido, fundament and testicular development.
Breeding boars are quarantined for 28 days. During this period, health tests are carried out, the phantom is habituated, semen

is collected and assessed.

Housing system

 Boars are housed in window stalls, individual pens with the possibility of movement in the enclosure. An area of 6 m² is required.

Movement and cleanliness of the boar is beneficial to its health, and it is recommended that boars be exercised every other day. Dry brushing and showering are used in the routine grooming of boars.

 A boar should have a constant handler, as turnover is negative for the boar's behaviour. Handling must be firm, kind and careful, and the boar must respect the handler.





https://web2.mendelu.cz/af_291_projekty2/vseo/print.php?page=511&typ=html
Production indicators of a thriving business

- Raised 22 piglets per sow/year
- Sow longevity 6 litters from 1 sow
- 2.2 2.4 litters per sow/year
- Minimum fattening gain 800g/head/day
- Feed conversion per kg gain up to 3.2 kg
- Maximum slaughter weight 105-108 kg
- Fattening time from birth to slaughter weight up to 175 days

Outdoor pig production systems

• High level of animal welfare.

Negatives - piglet mortality may be higher, exposure of animals to extreme weather.

Positives - plenty of space, expression of natural behaviour, individual shelter for piglets, shelter from bad weather, breeds resistant to these conditions used, advantage lower percentage of overliing piglets better sows health, advantage of absence of hard floor.

Housing for pregnant, lactating and farrowing sows (farrowing house)

- Group suckling of piglets in organic pig farming
- New system combined individual and group breeding
- Sow gives birth to piglets in a pen. They are in this pen for 14 days. The side walls of the pen are removed. A sow with piglets lives in a

group.





Outdoor pig rearing system

- They have the greatest potential for ensuring good welfare of growing pigs. There are many opportunities for natural feeding behaviour.
- Housing density is lower, reducing the risk of aggression.
- Subordinate pigs can easily escape from aggressive conflicts.
- There is no need to change the composition of the groups as the animals grow.
- Better gain and lower mortality the result of reduced stress.
- The pigs spend hours here.

Pigs health

- Health is an important aspect of welfare.
- Breeders follow the basics of biosecurity.
- Measures to reduce the contamination of stables –

closed herd turnover, turn-over technology, adequate density of animals, cleaning and disinfection of stables, adequate ventilation...

Parasitoses

- Parasitoses are one of the most widespread diseases in pig farms. Parasitoses do not cause mortality or significant disease, but have a major impact on the performance of pigs.
- Parasitoses internal and external
- The most important are the intestinal.

Coccidiosis

 caused by unicellular parasites of the genera Isospora and Eimeria. They cause infection and destruction of the intestinal mucosa. The disease is manifested by severe diarrhoea in piglets aged 5-15 days.



https://www.sciencedirect.com/science/article/pii/S1383576916302276

Roundworm

The roundworm eggs are swallowed. The larvae are released from the eggs in the intestine. These invasive larvae migrate to the organs. The adult roundworms mechanically irritate the lining of the intestine. They take nutrients from the intestinal contents and blood from the intestinal wall.



Ascaris suum infections | Laboratory of Parasitology (ugent.be)

Symptoms : Anorexia, anaemia, loss of condition. Weight loss in later stages.



Ascaris suum infections | Laboratory of Parasitology (ugent.be)

When the worms die suddenly after treatment, they can block the gut and cause sudden death.

External parasites

- mainly include lice, mange and myiasis
- Lice
- Haematopinus suis, the hog louse.
- Is the largest louse species (6,4mm)
- is more common in smaller populations than in commercial pig breeding. It is found in the folds of skin behind the ears and between the legs. The blood-sucking activity of hog lice results in much irritation and discomfort to swine. Skin may show red spots or bite wounds. Extreme pruritus and subsequent self-trauma (alopecia, erythema, excoriations, and crusting) can be seen.
- It can cause severe anemia, especially in piglets.



Mange

- in pigs is principally due to infestation with Sarcoptes scabieisuis.
- Transmission of *S. scabieisuis* can occur rapidly via direct contact between pigs.
- Mange live in the skin. It feeds on skin cells and their tissue fluid. They provoke severe itching and irritation.
- Lesions may start on the head, around the eyes, nose, or ears; Lesions may progress to hyperkeratosis and exfoliation of epidermal debris.



ADIS - National Animal Disease Information Service



Myiasis

 Myiasis is the infestation of living vertebrates with the larvae of flies, which lay eggs in the wounds. The eggs hatch into larvae. The larvae must feed on the tissues of affected animals, sometimes causing serious clinical problems, and even death.

 The deworming schedule should include prebreeding for all breeding stock and prefarrowing for gilts and sows, prevention of Strongyloides and roundworms in baby pigs, and one or more dewormings in weanling and growing pigs.

Reproductive Disorders and Diseases

• Brucellosis

Brucellosis in pigs is a contagious disease of domestic and wild pigs, which is manifested by reduced fertility in boars and sows.

caused by bacteria *Brucella suis*, dangerous disease

Symptoms

Symptoms are pronounced at the first encounter with the infection.

Severe symptoms are anorexia, fever, stiff legs, occasional lameness, early abortion. Infection later in pregnancy gives rise to litter with mummified, still born or weak piglets.

Boars usually develop orchitis (inflammation of one or both testicles) and epididymitis within seven days of infection.

The testicles are swollen and painful and permanent sterility can be the result.

If the infection has been in the breed for a long time the clinical signs are mild. The fertility of sows is lower and the number of piglets in the litter is lower.

Mastitis

Bacterial infection causes an inflammation of the mammary organ and results in changes in milk production. These bacteria enter the wounds in the udder.

Parvovirosis

- a viral disease found in most farms.
- Does not cause clinical signs in sows.
- Fertility disorders (as infection of embryos, mummification of fetuses, birth of short-lived piglets) occur in pregnant sows.
- Porcine reproductive and respiratory syndrome (PRRS)
- is a widespread viral disease that affects domestic pigs. Symptoms include reproductive failure (fetuses are fully developed), a breathing problem causes blue discoloration of the ears, snout or abdomen. Pneumonia and increased susceptibility to secondary bacterial infection.

Respiratory diseases

• PRRS

• Atrophic rhinitis

- Chronic bacterial disease of the upper respiratory tract. The bones and cartilaginous structures in the nose change shape.
 Signs are sneezing and runny nose.
- Other respiratory diseases are enzootic pneumonia and actinobacillus pleuroplneumonia.

Gastrontestinal tract diseases

Coli infection

- The level of immunity affects the course
- Escherichia coli is commensal intestinal mucosa or pathogen. Pathogenicity is dependent on virulence factors. The level of immunity affects the course.
- Transmission by ingestion of contaminated feed (orofecally). Symptoms are diarrhea or other (git disability, sudden death).

Salmonellosis

 Causes acute or chronic disease. The disease can occur as an involvement of the digestive tract or septicemia

Disease Causing Problems in Walking

- Arthritis
- Symptoms
- Inflammation of joints. Joints are swollen.
- Streptococcal infections
 Symptoms
- Septicaemia (blood poisoning) which may cause immediate death.
- Young pigs rarely recover
- Sudden death in older pigs.
- Fever, nervous signs and arthritis mostly in weaners and fatteners.

Skin disease

- Exudative epidermitis (EE), commonly known as "greasy pig disease" is a generalized or localized skin disease of piglets characterized by exfoliation, sebaceous exudation, and formation of a crust that may cover the entire body.
- staphylococcal infection





Welfare issues

Agressive bahaviour

- The reasons for it
- frequent regrouping of pigs into new pens with unfamiliar pigs.
- hight density of pigs in the groups of growing pigs.
- lack of bedding.

Problem with legs

- Concrete floor or slatted floor are used in intensive farming
- Concrete floors can cause cuts and scratches on joints and limbs.
- Laminitis and bursitis are often develops on the slatted floor (especially swelling of the knee joint).
- These problems are not visible in bedding system with straw.

Other welfare problems

- painful tasks in pigs
- Farrowing pens
- Hight reproductive intensity and exhaustion of females

Tail biting - one of the biggest problems of welfare!

- Multifactorial problem
- It is necessary to separate the victim and the attacker.
- Evidence indicates that tail-biting pigs are likely to be frustrated.
- According to European Food Safety Authority, the most important risk factor for an outbreak of tail biting is the lack of straw or other environmental enrichment in intensive systems.
- Ather risk factors are unsuitable microclimate, high stocking density and large herd, gastrointestinal discomfort, poor health status, suboptimal or imbalanced diet, individual factors (some genetic lines have a tendency to tail chew)
- Tail biting should be prevented by stimulating exploratory behaviour towards manipulable substrate
- Tail docking tends to reduce the incidence of bitten tails under controlled conditions, but does not eliminate the abnormal behaviour.
- Tail docking is still considered a routine management procedure on intensive farms to prevent tail biting.

Stable microclimate

• In our conditions, animals are kept in closed object for their entire lives.

From the point of view of microclimate, pigs are among the most demanding farm animals.

 A direct correlation has been shown between the high percentage of stillborn piglets, mortality losses at lactation and weaning, low gains and mortality and the amount of slaughter required in fattening and unfavourable microclimatic conditions in the stall.

Factors

- Temperature, relative humidity and air circulation are the most important. When these factors change suddenly, the organism reacts with physicochemical thermoregulatory mechanisms that maintain a constant body temperature.
- It primarily attempts to maintain a constant body temperature by engaging physical regulation, primarily by limiting heat output at low temperatures and by evaporation (direct evaporation from the body surface or lungs) at high temperatures. If this is not enough, chemical regulation is used.
 When temperatures fall or rise above and below the established limits, it means poored nutrient conversion due to cold or heat stress.

Temperature

- The air temperature is important, but important is also temperature of floors and surfaces. Ideally, the amount of heat transferred should be equal to the amount of heat produced by the organism without the need to engage thermoregulatory mechanisms.
- Low temperatures in the stall in winter increase feed intake and, conversely, higher temperatures in summer reduce consumption and lack of appetite due to reduced metabolism.

Relative humidity

 It is always assessed in relation to temperature. The humidity of the air affects the heat output of the body. In unheated stables there are problems with high humidity in winter due to insufficient air exchange. High humidity directly accelerates heat expenditure in animals at low temperatures.

In contrast, in heated stables there are problems with low humidity, which decreases with increasing temperature - increased dustiness, drying of mucous membranes, disruption of the body's protective barriers and increased susceptibility to infection. High humidity and temperature lead to the inhibition of heat transfer by evaporation and overheating of the organism.

 Clinically healthy pigs can tolerate a cool and dry environment without major problems for a temporary period.

Air flow rate

• At low temperatures, the airflow accelerates the heat output. Therefore, at optimum temperatures, an airflow of 0.1-0.3 m/s is required, at low temperatures the airflow must be reduced. At high temperatures above the maximum, increasing the airflow (sow stalls and fattening pigs) is the only way to prevent overheating (0.5-1.5 m/s). Higher air flow has a negative effect on weaning piglets even at higher temperatures. In pig farming, the rule applies - drafts (one-way air flow) must be avoided - above 3 m/s. High air flow at low relative humidity also increases dustiness.

Stable lighting

- Important not only for keeping the animals and equipment clean, but also for the physiological functions of the body. It is used in metabolism, affects the activity of the nervous system and blood composition...
- It is necessary to ensure not only the length of the lighting, but also the intensity and uniformity of the lighting. Recommended light intensity in farrowing rooms 75 lx, in fattening 40 lx, for boars 100 lx. Recommended length of natural lighting – 14 hours, in windowless halls for pig fattening, regime 3 x 1.5 hours or 4 x 1 hour.

Noise

 It affects the auditory and nervous organs, but also the whole organism. It is stressful when the maximum limit is exceeded reduced performance and health problems depend not only on the noise level, but also on the frequency and duration of exposure and the immediate physiological state of the animals.

Stable gases

Carbon dioxide

It is an indicator of insufficient air exchange in the stable. It is produced as a product of respiration, fermentation in the digestive tract and litter maturation. The normal concentration ranges from 0.2-0.3 per cent by volume - concentrations of more than 10 per cent by volume have a negative effect on the organism.

Stable gases

- The ammonia and sulphate content in the stall, which is produced by the degradation of organic nitrogenous substances in the stall, urine and excreta, also has a negative effect.
- Their effect is particularly pronounced after prolonged exposure
- These gases can increase susceptibility to infections
- Elevated concentrations of ammonia and sulphate are indicative of the level of hygiene in the stable! Maximum concentrations in the stall
 - is 25 ppm for ammonia
 - is 10 ppm for sulphate

Dust and microbial contamination

- Source feed, bedding and animals.
- Microorganisms are attached to dust particles or droplets.
- Saprophytic mikroflora and pathogenic micro-organisms may be present in the stable and survive for a certain period of time.
- The size of the particles is important factor. Particles larger than 5 µm are trapped by airway defence mechanisms, while smaller particles enter the airways..
- Dust particles settle in the respiratory tract and skin of pigs and can complicate respiratory disease in finishing pigs and piglets.

The human factor and care

- It is one of the crucial factors influencing animal welfare.
- It depends on the professional level of the animal handlers, their feeling and relationship with the animals, their attitude to work and compliance with technological procedures.

Assesment protocol for pigs

- Welfare Quality protocols are aimed at assessing the welfare level of sows and piglets in farrowing and fattening pigs.
- The protocol is based on 4 principles.



5.1 Collection of data for sows and piglets on farm

	Welfare criteria		Measures
Good feeding	1	Absence of prolonged hunger	Sows: Body condition score Piglets: Age of weaning
	2	Absence of prolonged thirst	Sows and piglets: Water supply
Good housing	3	Comfort around resting	Sows: Bursitis, shoulder sores Sows and Piglets: Absence of manure on the body
	4	Thermal comfort	Sows and Piglets: Panting, huddling
	5	Ease of movement	Sows: Space allowance, farrowing crates
Good health	6	Absence of injuries	Sows and piglets: Lameness Sows: Wounds on the body, vulva lesions
	7	Absence of disease	Sows and piglets: Mortality, coughing, sneezing, pumping, rectal prolapse, scouring Sows: Constipation, metritis, mastitis, uterine prolapse, skin condition, ruptures and hernias, local infections Piglets: Neurological disorders, splay leg

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	8	Absence of pain induced by management procedures	Sows: Nose ringing and tail docking Piglets: Castration, tail docking and teeth clipping
Appropriate behaviour	9	Expression of social behaviours	Sows: Social behaviour
	10	Expression of other behaviours	Sows: Stereotypies, exploratory behaviour
	11	Good human-animal relationship	Sows: Fear of humans
	12	Positive emotional state	Sows and piglets: Qualitative Behaviour Assessment (QBA)

6.1A Collection of data for growing pigs on farm (measured on farm)

	Welfare criteria		Measures
Good feeding	1	Absence of prolonged hunger	Body condition score
	2	Absence of prolonged thirst	Water supply
Good	3	Comfort around resting	Bursitis, absence of manure on the body
housing	4	Thermal comfort	Shivering, panting, huddling
	5	Ease of movement	Space allowance
Good health	6	Absence of injuries	Lameness, wounds on the body, tail biting
	7	Absence of disease	Mortality, coughing, sneezing, pumping, twisted snouts, rectal prolapse, scouring, skin condition, ruptures and hernias
	8	Absence of pain induced by management procedures	Castration, tail docking
Appropriate behaviour	9	Expression of social behaviours	Social behaviour

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9.5	10	Expression of other behaviours	Exploratory behaviour
	11	Good human-animal relationship	Fear of humans
	12	Positive emotional state	Qualitative Behaviour Assessment (QBA)