

# Poultry slaughter processing technology – Part 2

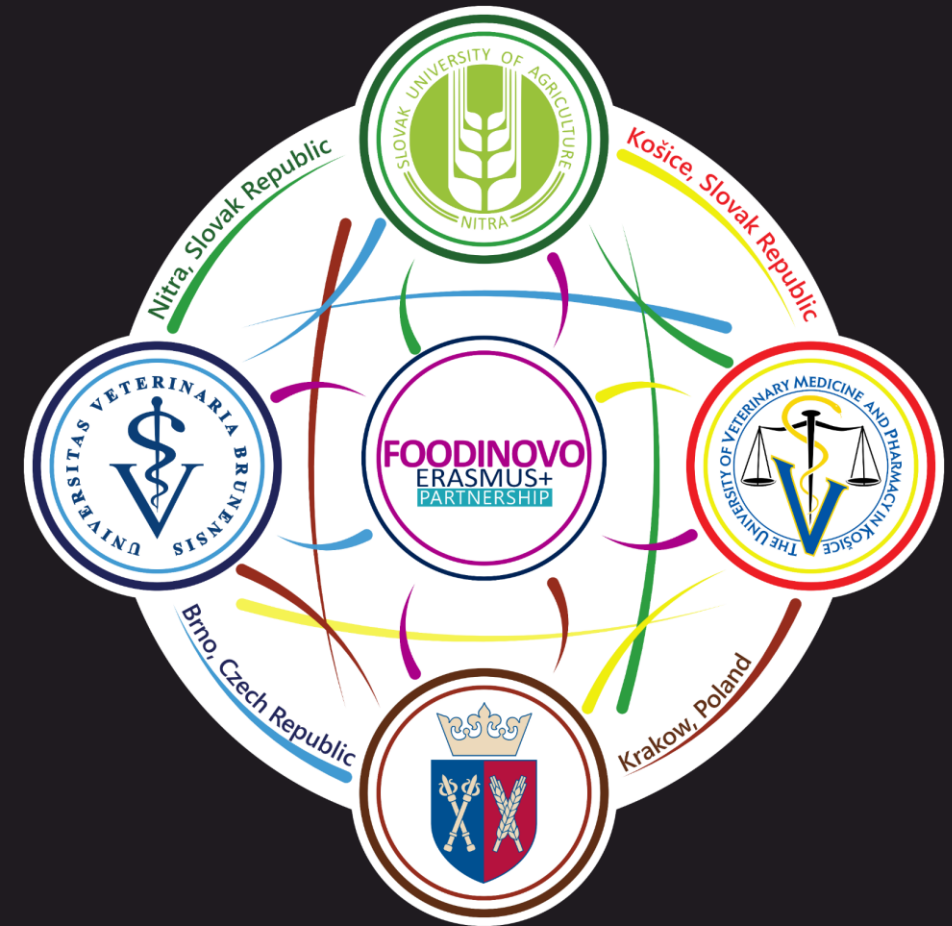


Fig. 1

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# Cutting plant

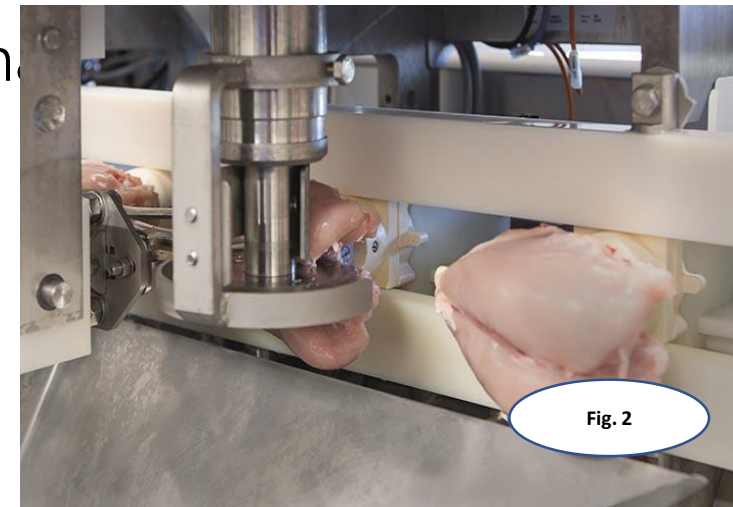
- is an establishment used for **boning** or **cutting up** meat.
- **Cutting and boning poultry parts:**
  - wings, legs and breast
  - is performed
    - **manually,**
    - **semi – manually and**
    - **fully automatically**



Fig. 2

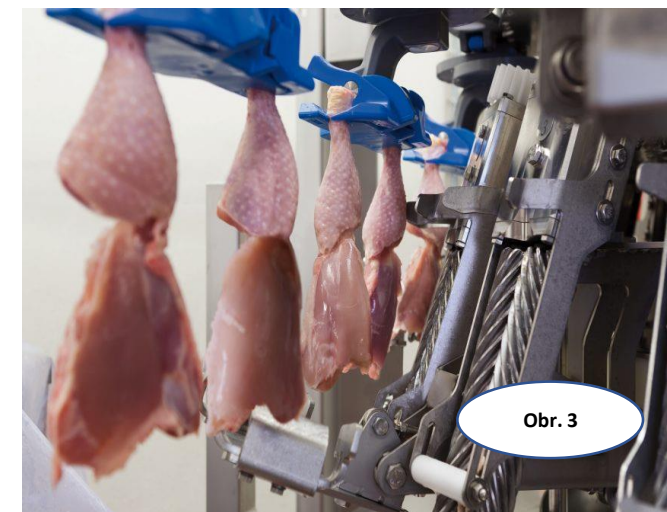
# Cutting process

- **Chicken halving machines:**
- cut the whole chicken into two parts so both the front and the back halves can be further cut into smaller parts. This machine is **line - operated** and **easily adjustable**.
- **Chicken breast processor:**
- the front half of the chicken.
- The whole breast are loaded by hand onto a spike holder that cradles the breast throughout the cutting process:
- **1. set of blades removes the wings from the breast,**
- **2. set of blades removes the back strip and**
- **3. cut is split the breast down**



# Deboning process

- **Chicken breast deboner:** a labor-saving deboning system,
  - remove butterfly breast fillets and tenders
- **Chicken leg processor:** process back half of chicken.
  - Machine is able produce: **leg quarter, whole legs, split thighs,**
- **Leg boning machines** – separate the bone and the leg meat.
  - Eliminating manually handling from deboning of poultry
  - higher quality of final product



# X ray inspection deboned meat

- This technology is important for poultry processing operation
- providing deboned products, especially

chicken breast fillets, thigh and drumsticks, and trimmings.

- X-ray bone detection automatically finds bones and other hard contaminants in poultry meat and rejects products from the processing stream, enabling processors to deliver consistently safe, high-quality products.
- X-ray detection systems play a crucial role for processors who need to meet the most stringent food safety legislation requirements.



Obr. 3



# Poultry cuts

- Half, Quarter, Unseparated leg quarters,
- Breast, Leg, Chicken leg with a portion of the back,
- Thigh, Drumstick, Wing, Unseparated fillet,
- Breast fillet, Breast fillet with wishbone,
- Magret, Deboned turkey leg meat
- Poultry breast, leg, chicken leg with portion of the back,
- thigh, drumstick, wing, unseparated wings and
- breast fillet may be presented **with or without skin**.
- **boneless turkey leg**
- **Magret:**
- breast filet of ducks and geese comprising skin and subcutaneous fat
- covering the breast muscle, without the deep pectoral muscle.



Obr. 4

# Properties of a good cutting system

- accurate, high – yield cut up, limitless layout and production flexibility,
- highest percentage of A – grade cuts in the poultry processing industry
- modules can be set accommodate a wide range of flock weights
- the various modules allow to produce various products including those where the an anatomic cut is needed
- combination of cut – up system with production control software enables
- the producer to ensure the best use of incoming product and give
- him fully comprehensive reports on what has been produced.
- Module settings can be adjusted with ease via a touch screen menu.
- Doing this all relevant modules would retune to the new situation
- The systems yield would increase and the quality of filleting process

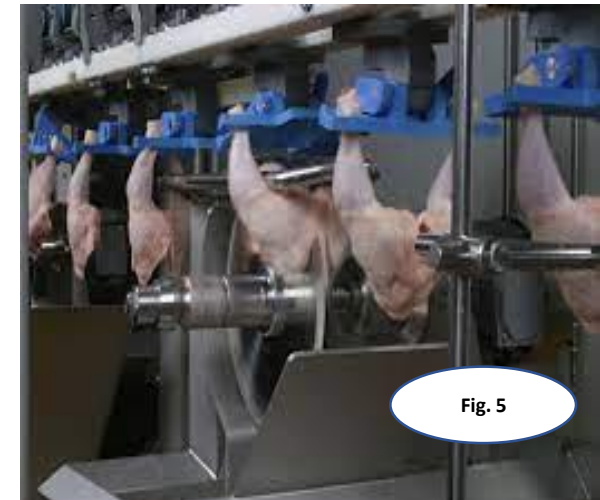


Fig. 5

# Mechanically separated meat

- MSM is the product obtained by removing meat from flesh
- bearing bones after boning or
- from poultry carcasses,
- using mechanical means
- resulting in the loss or modification of the muscle fibre structure
- It must comply with requirements for fresh meat,
- poultry runner, skin of neck, and head
- must not be used to produce MSM.
- Ca content shall not exceed 100 mg/100g of sample





# Temperature conditions

- slaughtered poultry and poultry parts intended for mechanical separation must be stored at  $t -2\text{ }^{\circ}\text{C}$  to  $+4\text{ }^{\circ}\text{C}$  and it must be processed for MSM within 24 hours of obtaining it, if the raw material intended for MSM cannot be processed within 24 hours, it must be frozen, frozen poultry intended for mechanical separation can be stored at  $-18\text{ }^{\circ}\text{C}$  for no more than 1 year,



# Types of MSM



- Low pressure MSM ( $< 10^4$  kPa):
  - is produces using techniques that do not alter the structure of the bones used in the production of MSM
- High pressure MSM ( $> 10^4$  kPa):
  - is used only for heat treated products because of higher microbial contamination and potential for deterioration

# Belt – drum system technology

- Baader and SEPAmatic system - use low pressure
- The tissue is passed between a rubber belt and a micro grooved steel drum.
- Meat passes through the holes (1-10 mm) in the stainless steel drum in bones,
- skin and thicker layers of connective tissue remain on the outside of the drum
- and are ejected through a discharge chute.
- pressure on the belts can be adjusted, and pressure rolls are used to ensure
- an even distribution of the tissue on the belt.
- The derived mince may be refined by passing it through a strainer (1-2 mm)
- that removes most particles and small pieces of belly lining.
- The mince can range from a source texture to a fine paste depending
- on source material, machine type and setting and processing method
- Derived product is used for preparation meat balls, sausages



Belt Technology

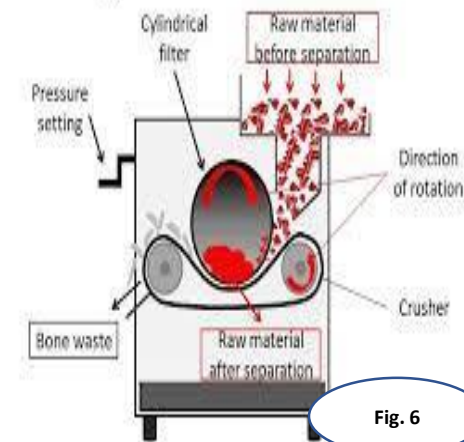
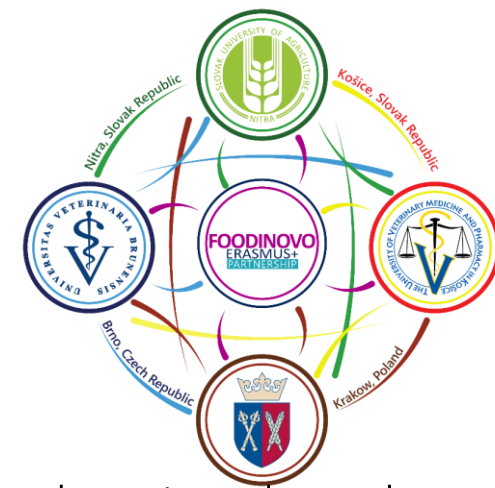


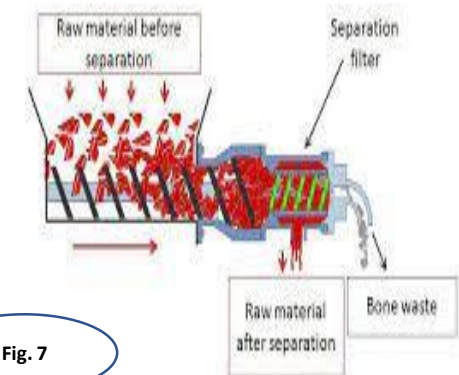
Fig. 6

# The rotating auger system

- e.g. AM2C, BEEHIVE, Townsed, Marel, LIMA, CFS/GEA
- bone cutter: reduces the size of the bones and carcasses
- The ground bone and meat mixture is introduced into a screw – driven boning head.
- The material is pressed with the high pressure and meat is squeezed out through a perforated steel with holes 0,5 mm and cylinder encasing the auger.
- The bone and connective tissue particles that cannot pass through the perforated cylinder are pushed forward and exit at the end of the head.
- High pressure causes bone disruption and modification of the muscle fiber structure – therefore these products must be used in the manufacture of heat treated meat products as a frankfurters



Endless Screw



# Hydraulically pressed batch system

- Protection, Townsend, Marel, system, The process involved:
- **Presizing** – is dividing the bones into sections **10-15 mm in length bone**
- sections are then **pressed** at the high pressure in a piston-like device
- with holes in the walls and the pressing head.
- As a bone are crushed and compressed, meat is pushed off the bone, through filters,
- and away from the machine, via the product outlet.
- Compressed bones are ejected from the chamber.
- **Meat** is passes between **belt and drum (holes 1-1.3 mm)**.
- Sinews, cartilage, bone particles are removed.
- Product is ready for use.
- **At pressure 180 bar, meat** begins to flow first, followed by **fat** and
- **some connective tissue**, while heavy connective tissue and
- compacted bones remain within the chamber.



Linear Separator

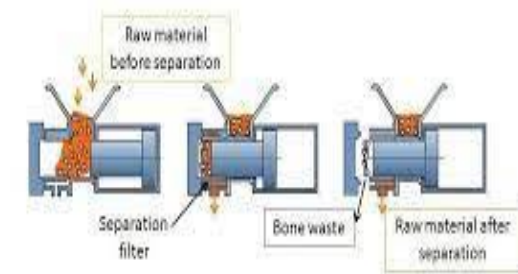
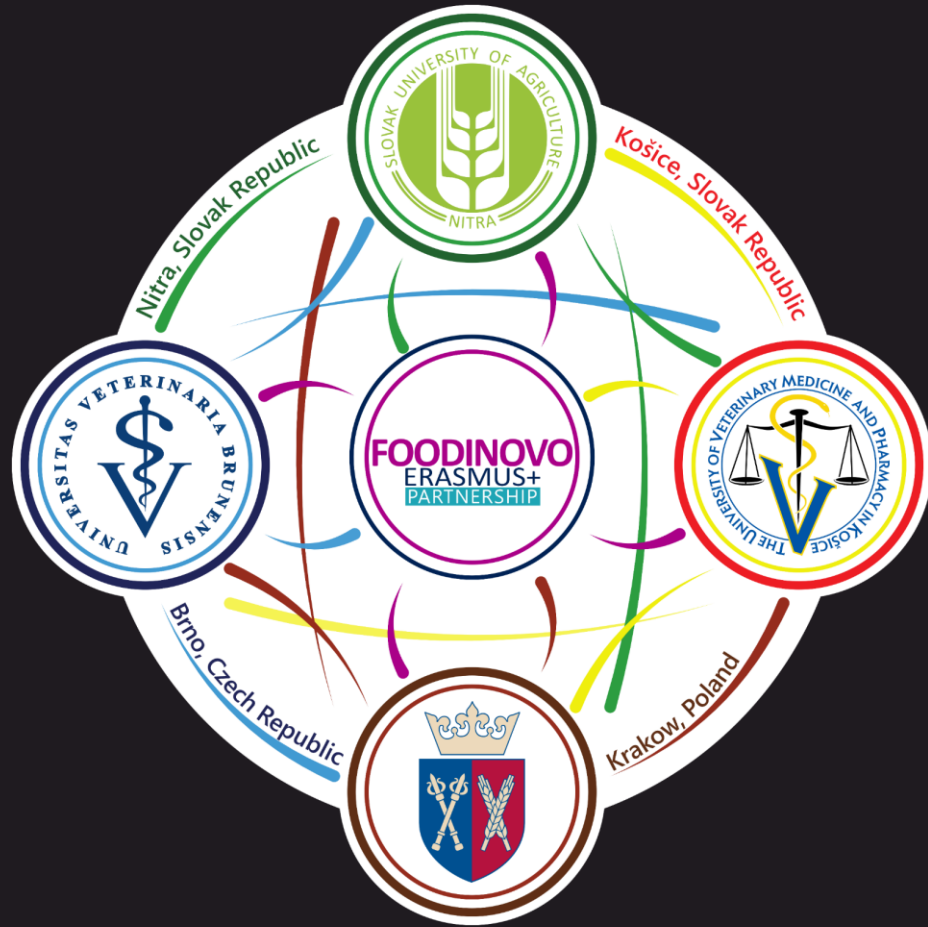


Fig. 8







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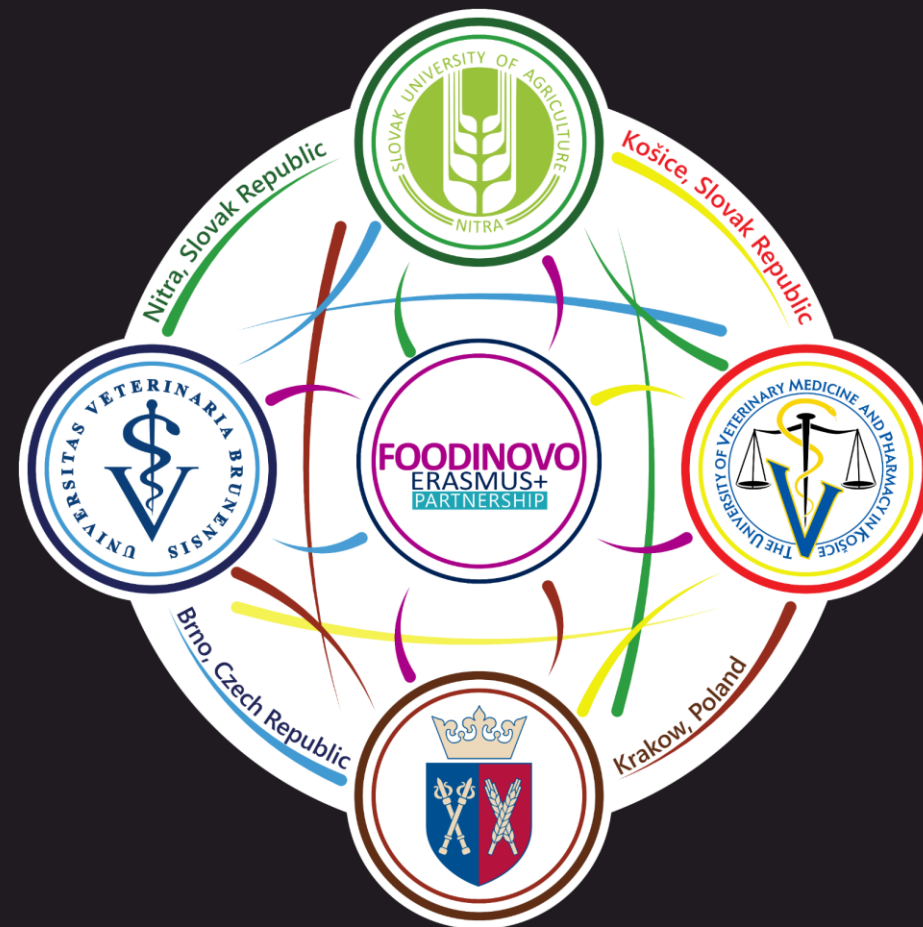
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