Meat processing problems

The meat processing industry has an important place in the food industry. However, there are significant problems that limit the contribution of the industry to the red meat sector, particularly with regard to the livestock enterprises which are the source of raw materials. The aim of this lecture is to identify the problems of the red meat processing industry, and to suggest solutions to these problems. Red meat is important in human health and nutrition, red meat is a source of high biological value protein, iron, zinc and various B vitamins , The recommended protein intake for an adult is 0.83 grams per kilogram of body weight per day according to World Health Organization.

The red meat industry is seen as including the whole process starting from the slaughter of animals in slaughterhouses through to the packaging of final products for sale. **The main enterprises operating in the industry** are **(i) slaughterhouses; (ii) meat combines (which both slaughter animals and process meat and meat products); and (iii) meat and meat product processing plants**. In order to ensure safe and healthy products are consumed, it is important to constantly evaluate agricultural raw materials in the industry before presenting them to consumers. our aim in this lecture is to identify the problems of enterprises operating in the red meat processing industry and to develop solutions for these problems.

The main Problems of red meat processing

A-Problems of red meat processing industry enterprises – livestock

1. There is a problem in supplying quality feed and feed prices.
2. There is not enough rangeland.
3. Agricultural organization in beef cattle farming is insufficient.
4. It's difficult to find fattening material.
5. (illegal animal entry)Control of animal movements is inadequate.
6. The farming of beef and dairy cattle together negatively affects production.
7. Animal diseases negatively affect production.

B-Problems related to raw material

1. Carcass meat prices are unstable Meat price is not determined according to the quality.
2. Technological conditions in the slaughterhouses.
3. Animals to be slaughtered are brought to the slaughterhouses under inappropriate conditions.
4. Cold chain is insufficient in carcass meat production and distribution.
5. The carcass meat yield of animals is low.

C-Problems related to production

1. Financing costs are high.
2. Energy costs are high.
3. Lack of qualified staff.
4. There is unregistered production in the sector.
5. Labor costs are high.
6. The capacity utilization incentives related to production.
7. The location of the production.

D-Problems related to marketing

1. Logistics costs are high.
2. Counterfeiting and adulteration in meat products.
3. Insufficient levels of demand for final goods.
4. Lack of information about the market.
5. Red meat has a promotion problem.
6. The number of vehicles equipped for safe meat transportation.

Solving Meat processing problems by

1-controlling of raw materials: The development of new methods of evaluation and more rapid procedures in obtain objective data on raw materials is needed for meat processing operations. rapid methods of analysis for the quality of raw materials such as: For example, we need spices, non fat dry milk, meat, etc ....completed on many raw materials, the data is of limited value. Thus, a by the time analyses can be great deal of subjective evaluation is presently used in ascertaining the quality of raw materials used in meat processing.

2-material handling systems: We need to obtain a closer coordination between equipment manufacturers and food science research and technology groups.

3-control of flavor componews: it is extremely important that more basic research be conducted on methods of approach for the control or development of flavours and aromas.

4-industurial cookery methods: We have a long way to go in the development of better methods of large scale meat cookery and heat processing. Present methods allow too much loss in the transfer of heat energy to products and the variation in internal temperature at the end of the cooking cycle is too great. Naturally, **these problems can result in high bacterial numbers, color differences, and poor scheduling of production.** All of these difficulties add up to a variation in quality of the find product as well as ineffective supervision in plant processing.

5-control of meat product inventories a serious problem with all processors. Schedules must be written as much as four to five days ahead of anticipated sales. In many cases, production thus, the regulation of

inventory of perishable products is very difficult and may result in distressed product or in a shortage to customers. A reduction in processing time would be of significant value in meeting rapid inventory turnover.

6-development of in-plant methods of analyses and control: We need for example, **rapid and quantitative tests** for **nitrite content**, more extensive methods of in-plant objective analyses for the **control of production**. **colour**, **product moisture**, **bacterial content, the free fatty acid content, degree of doneness in certain process end-point measurement**, et cetera ,would be of great value in controlling production.

Problems and solutions observed during Poultry Processing

Poultry is processed primarily to convert the birds' muscles into meat, to remove the unwanted components of the bird (blood, feathers, viscera, feet and head), and to keep microbiological contamination at a minimum.

The ultimate quality of the final product depends not only on the condition of the birds when they arrive at the plant but also on how the bird is handled during processing. Bruising, broken bones, missing parts and high carcass reprocessing numbers can cause significant economic losses. Unloading, stunning, slaughter, scalding, picking, eviscerating, chilling and packaging poultry are some of the processing steps that can result in product defects. Thus, these steps must be continuously monitored and precisely controlled.

Reference guides for problems observed during Poultry Processing Problems.

1-Catching, Cooping and Transporting Live Broilers

At the grow-out house, market-age broilers are caught by the live haul catch crew, loaded into coops and transported to the processing plant. During catching, minimize bruising because it results in carcass downgrading and yield loss. Ninety per cent of bruising occurs within 12 to 24 hours before processing. Areas most frequently bruised are the breast (42 per cent), wings (33 per cent) and legs (25 per cent).

2-Receiving, Holding and Unloading Live Broilers

When birds arrive at the plant, they need adequate ventilation in the holding area to minimize mortality and excessive live shrink. Broilers should arrive at the plant and be scheduled for processing eight to 12 hours after their last feeding. This decreases the amount of material that could potentially contaminate the carcass during processing by allowing adequate time for the bird's gastrointestinal tract to become empty.

Be careful during the unloading and hanging steps to minimise carcass bruising, broken legs, broken wings and red wing tips.

3-Stunning, Slaughtering and Bleeding

Stunning of broilers is commonly done in the range of 12 to 150mA (milliamps) per bird of electrical current for a duration of two to 11 seconds. This practice is important, not only because it renders the bird unconscious, but also because it affects bleeding, feather release and overall meat quality. When the stunning voltage is high, wing haemorrhages, red skin condition, poor feather removal, broken bones and blood splashes in the meat may result.

4-Scalding and Defeathering

After bleeding, birds are scalded by immersion in a scald tank for 1.5 to 3.5 minutes, depending upon the water temperature. Scalding facilitates feather removal, but only if a uniform temperature is maintained throughout the scalder. When the scald temperature is too high, carcasses become discoloured due to uneven moisture loss. If the bird is alive when it enters the scald tank, the trachea, oesophagus, lungs, crop, gizzard and air sacs may become contaminated with scald water. The resulting carcass will be red in appearance. Moreover, the lungs may collapse and be difficult to remove, or they may drip as the viscera is transported through the plant.

Carcasses leave the scalder and go through a series of pickers designed to remove feathers from the body, wing, hock and neck. Feather removal is most successful when the pickers are placed close to the scalder so that the bird's body temperature remains high during picking. The pickers can be a major source of carcass bruising, wing breakage and broken hocks, especially if rubber fingers are worn or not positioned correctly.

5- Problems and solutions observed during uploading broilers through the picking room

Observations	Causes	Corrective Action
1-Wing Damage	1-Wings caught on coop door. 2-Hangers too rough. 3-Field causes.	1-Make sure doors on coop at proper angle for dumping. 2-Hangers should not pick up birds by the wings. 3-A check for field bruises/broken bones.
2-Carcass Bruising	1-Stunning voltage too high. 2-Field causes.	1-Check voltage. 2-Adjust pickers daily. 3-Check flock placement density in grow.
3-Poor Bleed-out, "Red Birds," "Red wing tips"	1-Improper setting for neck cutting. 2-Bleed time too short 3-Birds not properly stunned.	1-Do not severs the spinal cord, trachea or esophagus during neck cutting. 2-Adjust killing machine & sharpen knife. 3-Check with the back-up personnel. 4-Make sure the bleed time is at least 55 seconds. 5-Allow birds time to calm down before stunning. 6-Check the stunner. Check scald temperature (124-138°F).
5-Dead birds on line (cadavers)	1-Hangers too rough. 2-Neck cutting malfunctioned.	Check hanging .
6-Shattered bones, disintegrated hearts and livers, pooled blood in the body or blood spots in meat	Stunning voltage too high.	Adjust stunner and stunning conditions.

7-Mis cut or broken hocks	1-Improper setting on hock cutters. 2-Worn equipment. 3-Birds not hung correctly. 4-Bird size variation. 5-Weak bones.	1-Check hock cutters with each bird flock; adjust properly. 2-Check foot un loader. 3-Check with nutritionist if you suspect weak bones.

6. Problems and solutions observed during poultry evisceration

Observations	**Causes**	**Corrective Action**
1-Carcass Contamination	1-Broilers off feed too short or too long before processing. 2-Intestines are cut or torn.	Adjust feed withdrawal time to 8-12 hours.
2-Oily Birds	1-High scald temperature. 2-Pickers too close together.	1-Check & adjust scald temperature, if necessary.2-Adjust pickers, if necessary.
3-Abnormal condition of intestines	1-Weak intestines. 2-Possible disease condition.	Check for possible disease conditions in the field.
4-Carcasses contaminated with bile	Feed withdrawal time too long.	1-Check to see if gall bladders on eviscerated broilers are enlarged. 2-Check evisceration equipment.

7. Problems and solutions observed during chilling and packaging

Observations	Causes	Corrective Action
1-Carcass/parts moisture too low or too high	1-Improper time in chiller. 2-Improper temperature sequence of chillers. 3-Cuts, tears, excessive loose skin.	1-Notify chiller operator.
2-Bird temperature too high or too low	Improper temperature in chiller.	Adjust temperature of chiller.
3-Stated weight is not the same as actual weight.	1-Scale is off. 2-Improper moisture pickup.	Check scales daily.
4-Product returns for off odors	1-Product is warming during storage or transportation. 2-Contact with contaminated surfaces or other contaminated products.	1-Check product storage temperature, out-going product temperature & chiller temperature.