B. Introduction to feed processing technology

Why processing feeds/feedstuffs?

1. Maintaining or improving nutritive value: increasing digestibility and nutrient accessibility
2. Preventing spoilage
3. Isolating specific components from feeds
4. Detoxifying poisons or anti-nutritive factors
5. Improving handling efficiency, reducing wastage
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Belitz et al. (2009)
Food Chemistry, 4th Ed.

Fig. 0.4. Food shelf life (storage stability) as a function of water activity (according to Labuza, 1971)

Ruvinsky et al. (2011)

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### Classification – based on types of process

1. **Physical processing**
   - Drying (pengeringan)
   - Heating (pemanasan)
   - Soaking (perendaman)
   - Boiling (perebusan)
   - Steam (pengukusan)
   - Irradiation

2. **Mechanical processing**
   - Chopping (pencacahan)
   - Grinding (penggilingan)
   - Pengupasan (peeling)
   - Extruding
   - Pelleting
   - Crumbling
   - Cubing
   - Flaking
   - Baling
   - Wafering
   - Micronizing
   - Popping

3. **Chemical processing**
   - Acid treatment
   - Alkali treatment
   - Ammonation
   - Use of animal manure for processing feed

4. **Biological processing**
   - Mould (fungi)
   - Yeast
   - Bacteria
   - Silage
   - Enzyme
   - Probiotic and prebiotic

### Some selected processing techniques

#### Cubing
The process of compressing cut hay into small square cubes

**Advantages:**
- Easier to store and handle
- Eliminates dust
- Reduces selectivity by animals
- Can also be used with roughage/concentrate mixture
Pelleting
The process of forcing a ground, moist feed through a die and compressing it, then cutting at certain lengths; These can vary in length and diameter

Advantages:
- Easier to store and handle
- Less bulky
- Reduces dusts
- Reduces selectivity by animals

Crumbles
Crumbles are pelleted feeds that have been further reduced into granular form.

Block
In the block form, feed is compressed into a single mass that holds its form (usually a square or rectangle). Blocks are most commonly used to supplement minerals or protein to animals in the pasture.

Ensilage process
Silage can be made from grain corn, grass, legumes, grass-legume mixtures, etc.

Advantages:
- A wide variety of crops can be used
- Harvesting and feeding can be mechanized to reduce labor
- Less field and harvest losses than hay
- Less possibility of weather damage
- Can be stored for long periods of time
- Decreased selectivity by animals
- Highly palatable

Disadvantages:
- Requires specific equipment and storage facilities
- Bulky
- Requires skilled management
Thank you for your attention!