

Yem teknolojisi

Yemin önemi ve işleme gerekçesi

- Feed is a major part of the cost of production – 55% dairy and sheep, 80% poultry
 - Get more nutrients out of the feed
 - Reduce waste
 - Higher producing livestock need
 - Palatable rations
 - More intake
 - Efficient use of nutrients



- Processing can
 - Alter physical form, particle size
 - Reduce spoilage
 - Isolate plant parts grain from plant, starch from grain
 - Improve or reduce palatability
 - Inactivate toxins, other anti-nutritional factors
 - Improve handling

- Cold processing
 - Rolling – crushed between crimped rollers
 - Fast, economical processing of like grains
 - Grinding – broken into pieces with swinging hammers
 - Slower, requires more energy than roller, can process different grains at the same time

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- Soaking and reconstitution – swells seed coat
 - Not suited to large quantities
 - Must be fed quickly
 - Limited transport to distant feeding areas
 - Sprouting legumes reduces anti-nutritional factors
- Acid preservation – ensiling or treating grains with organic acids
 - Requires air-tight storage, limited ability to transport
 - Stored at 30 – 35% DM, produces lactic acid
 - Reduces need to dry fresh grains prior to storage
 - Good palatability, but reduced intake with HM forages

Yem teknolojisi-2

- Heat processing
 - Steam rolling or flaking
 - Introduce hot moisture (steam) then roll
 - Flaking holds grain in steam longer for higher moisture, flatter grain flake – gelatinizes starch



- Pelleting
 - Grinds feed and pushes the mash through holes to make round pellets – some gelatinization
 - Increased density over ground or flaked grain
 - Multiple ingredients can be incorporated into the pellet
 - Fines can be made palatable



- Extrusion

- Like pelleting, but can be higher moisture, fat
- Extruded products dry and are crumbled
- Heats the product – destroys anti-growth factors in legumes, protect some protein from rumen breakdown



- Popping, Exploding

- Open the seed coat by heating interior moisture to explode endosperm
- Reduces density of feed significantly
- Not suited to processing large quantities, uncommon use today

- Spray coating processed grains

- Fat or molasses sprayed on or mixed in processed feeds
- Coatings may include yeast, mineral/vitamin sources, etc.
- Increases palatability, reduces dust, fines

- Baling – tightly tied dried forage wafers
 - Increases density for handling, storage
- Chopping – cutting forages into small pieces
 - Aids in mixing with other ingredients
 - Can improve intake and digestibility of lower quality forages
- Pelleting – pushing chopped forages through holes to create pellets
 - Usually larger than grain pellets
 - Can incorporate other ingredients for a “complete” feed
- Cubing – making 2” x 2” square pellets
 - Easier to handle than baled hay
 - Fairly expensive and slow, uncommon except for export products

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Yem teknolojisi-4



- Drying, dehydration
 - Reducing field losses of forages by artificial drying
 - Usually pelleted as part of process
- Field kernel processing
 - Roller mill on corn silage harvester to crush kernels for better digestibility of starch in corn silage

Yem teknolojisi-5

Effect on nutrients

- Reduces particle size, exposes nutrients for action by microorganisms, tissues of digestion
- Generally increases passage rate
- Can increase feed conversion to production, maintenance requirements
- Heat treatment
 - Of legumes reduces anti-growth factors
 - Of grains will gelatinize starch making it more digestible
 - Can reduce vitamins and increase oxidation
- May reduce or increase feed density

- Medium grind grains to swine, pelleted can benefit fast growers
 - Pellets also allow incorporation of vitamin/mineral premix and small amounts of forage when needed, reduce sorting
- Rolled or cracked grain for horses
 - Little or no processing of forages
 - Larger complete feed pellets are convenient and reduce manure
- Crumbles (crushed pellets) best for poultry
 - Better feed conversion, less water consumption, litter "caking"
 - Little or no forage fed to poultry
 - Table 11-5 on page 210



Yem teknolojisi-6

Effect on animals

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Yem teknolojisi-7

Effect on animals

Beef Cattle

- Grain processing – mostly for feedlot cattle
 - Some processing will improve intake, efficiency
 - Coarse grinding enough, some improved starch digestion with heat treatment
 - See Table 11-7 on page 212 for details of comparisons
 - As forage increases, processing advantage decreases
- Forage processing
 - Mostly to improve handling, mixing, delivery
 - Slightly faster forage passage rate, higher intake
 - Cubed forages not economical, too large for young beef
- Pelleted feeds can reduce waste when feeding on the ground, allow other supplementation (mineral/vitamins, protein) in one feed
- Supplements can be pressed into large blocks
 - Regulate intake, reduce labor of supplementation

installation help.

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Yem teknolojisi-8

Effect on animals

Dairy Cattle

- Grain processing important
 - High nutrient requirements
 - Must balance rapid digestibility with acetate in rumen for milkfat production, reduced acidosis
 - Course grinding, dry rolling adequate for TMR feeding
 - “Textured” feeds of pellets and rolled or flaked grains best for separate feeding of grain as in milking parlor
- Some forage chopped for mixing and handling convenience
- Table 11-9 on page 214 summarizes dairy feeding trials

Sheep & Goats

- Limited processing required, fast-growing lambs only
- Pellets can limit ground feeding waste, increase forage intake
- Dairy goats can receive dairy parlor grain

Yem teknolojisi-9

Economics of processing

- Function of cost vs. benefit (Is production improved or feed use diminished enough to pay for the process?)
- Processing takes energy, equipment investment, maintenance, labor, raw and processed storage, control of waste

Yem teknolojisi-10

Change in feed density

- Most processing except pelleting, baling, cubing reduces density (lb/ft³)
- Higher fiber feed or processing → lower density → more storage space
 - 1 ton shelled corn takes 44.4 ft³ storage
 - 1 ton flaked corn takes 58.8 ft³ storage
 - Table 11-14 on page 220