

CATTLE FEED PELLETS

What is the Cattle Feed Pellet?

Cattle feed pellet is an all-in-one pellet form feed made by feed pellet mill through great pressure. It is a kind of feed that is not only for oxen, cows, cattle but also for sheep, and goat reared for their milk and meat. It contains protein, minerals and other nutrients which are useful for beef and milk production and survival of the animals.



Raw materials for making cattle feed pellets

Cattle feed pellets can be prepared from oil cakes, agro-residues such as peanut seedling, grass, maize straw, wheat straw, grain, wheat bran, flour mill by-products, cereals, molasses, and so on

Feeding cows with pellet feed

Animal	For Body Maintenance	For Milk Production
Cow	1 kg per day	1 kg Feed 4.0 kg Milk

Buffalo	1.25 kg per day	1.25 kg. Feed 4.0 kg Milk
---------	-----------------	------------------------------

Cow- Last Eight Week of Delivery 1.0 kg to 2.0 kg Feed per Day

Buffalo- Last Eight Week of Delivery 1.25 kg to 2.5 kg Feed per Day

Processing technology of livestock feed pellets

1. Raw material reception and storage

Livestock feed raw materials vary, they include: long material like crop straw, grains like wheat, maize, and others like oil cake/meal, additives, etc. different raw materials have different storage methods. For example, in complete feed pellet line of large capacity, storage silo is necessary for storing maize, wheat, and other grains.

2. Feed material cleaning

The impurities in feed raw materials not only affect the quality of feed products but also directly relate to the feed processing equipment and personal safety. In serious case, the whole equipment can be destroyed, which impacts the smooth progress of the feed production, so the impurities must be removed in time. The cleaning equipment of the feed pellet plant is based on screening and magnetic separation equipment. Screening equipment is used to remove large

and long impurities such as stones, mud blocks and sacks. The magnetic separator is mainly used to remove iron impurities.

3. **Feed raw material crushing**

The technological process of feed crushing is determined according to the required fineness and the variety of feed. According to the times of raw material crushing, it can be divided into one stage crushing process, circulation crushing process or two stage crushing process. According to the combination form of batching, it can be divided into first batching, then crushing and first crushing then batching technology

4. **Feed material batching/proportioning process**

At present, the commonly used batching processes include manual batching, volumetric batching, one warehouse one scale batching, etc. Manual batching is mostly utilized in small feed pellet plant and medium scale feed pellet factory (capacity 1-15T/h). In this batching technology, all feed materials are weighed manually by workers and poured into the mixing machine. As the whole process like measuring and proportioning is all operated by manpower, it needs less equipment investment and low production cost, and has flexible and precise measuring.

5. **Feed mixing process**

There are 2 feed mixing methods: **batch mixing** and **continuous mixing**. Batch mixing is to blend all the components together according to the proportion of the formula, and mix them in the periodically

running "batch mixer". This mixing method is convenient for replacing feed formula, and the intermixing between each batch is less, so batch mixing is commonly applied at present. However, as the start and stop operation is complex, the automatic program control is mostly used.

The continuous mixing process is a continuous measurement of all kinds of feed components at the same time respectively and proportionately matched to a stream containing various feed components. When the stream enters a continuous mixer, it is mixed continuously into a uniform flow of material. The advantage of this process is that it can be carried out continuously, easily with comminution and granulation, so the production does not need to operate frequently. but when changing feed formula, the adjustment of the flow is more troublesome and the material residue in the continuous conveying and continuous mixing equipment is more, so the intermixing problem between the two batches of feed is more serious.

6. Feed pelletizing

There is 600-1000kg/h small feed pellet plant that uses flat die feed pellet machine and 1-15T/h medium feed pellet line that uses ring die feed pellet mill.

Flat die feed pellet machine: the mixed feed material is uniformly distributed into the feed pellet machine, and the rotating roller and flat die will press the material, and the densified material go through flat die holes to form cylindrical granules, finally desirable size (both length and diameter) feed pellets are cut by the cutting blades and discharged from the feed pellet machine outlet.



Ring die feed pellet mill: in medium to large scale feed processing factory, feed material conditioning (tempering) is necessary, so ring die feed pellet mill is usually equipped with a conditioner on the top. The conditioning result directly influences feed pellets quality. The purpose of conditioning is to add water to the feed powder to let it has certain moisture content. After conditioning, the feed material is distributed evenly between the roller and ring die, so the feed pellets are pressed out through ring die holes, cut and discharged



7. Feed pellets cooling

As in the process of pelletizing, the feed is input high temperature and humidity steam, and the squeezing process generates great heat, so the feed pellets moisture content can reach 16-18%, and temperature reach 75 °C-85 °C. Under this condition, the feed pellets are easily

deformed and broken, and would bond and mildew in storage, so it is necessary to reduce their moisture to below 14% and decrease the temperature to below 8 degrees Celsius.

8. Feed pellets crumbling

For making young livestock feed pellets of small size, crumbling is also necessary. In order to save electricity, increase the output and improve the quality, the feed material is often made into a certain size pellets in order to save electricity, and then broken into required smaller pellet size. But it is not a must for all feed pellets manufacturers.

9. Sieving (screening)

In small feed pellet plant, this process is realized by the feed pellet cooler. But in larger capacity medium feed pellet line, if the crumbler is used, the pellet sieving machine is also needed, since it can separate the powder from eligible feed pellets, so that uniform feed pellets can be deliver to later packaging process, and the powder or ineligible feed pellets can go back for reproduction.

10. Feed pellets packaging

Equipment for making cattle feed pellets

Machinery and equipment required in the cattle feed pellet production line are as following.

1. Tank (or other containers) for raw and auxiliary materials storage
2. Feed hammer mill (feed pellet grinder) for grinding the raw materials to feed powder.
3. Feed pellet blender (feed pellet mixing machine) used to mixing powdered materials to improve the uniformity of the ingredients.
4. Feed pellet mill (feed pelletizer) is the main equipment for making the cattle feed pellets.
5. Feed pellet cooler is used to cool the hot and moisture feed pellets (if our production capacity per day is not so much, we will not need this pellet cooler, just dry the pellets in the sun is ok)
7. Feed pellets screening and grading machine is used to remove the fines and grade the pellets, which is the preparation for packaging.
8. Feed pellet weighing and packaging machine is used to weigh and pack the pellets in the uniformity

9. Other auxiliary machines (conveyor, lifter, etc. Usually used in an automatic cattle feed pellet line)

Table 1.4: Cattle feed Plant Flow Chart

Section	Main Machine	Application
1. Raw material cleaning section	Cleaner and Magnetic Tube	cleaning dust in the materials
2. Crushing section	Hammer mill, dust collector	crushing materials into powder
3. Mixing section	Mixer, conveyor	mixing different kinds of materials
4. Pelletizing section	Pellet machine, conveyor	Pelletizing pellets
5. cooling section	Cooler, crumblier, screens	Cooling pellets
6. Packing section	Packing machine, conveyor	Packing pellets into 10-50kg/bag
7. Electric control system	Electric cabinets, cables	control the whole plant

Benefits of manufacturing Cattle Feed Pellets

1. From a feed manufacturer's perspective, the benefits of making feed pellets include decreased segregation of mixed feedstuffs, increased bulk density, reduced dustiness and improved handling characteristics.
2. For farmers making own cattle feed, will greatly save cost compared buying feed pellets from other manufacturers.

Materials suitable for making pellets

Spruce Wood	Pineapple Peel	Grass Powder
Turfgrass Powder	Bamboo	Canola Straw
Chicken Litter	Fresh Grass	Soybean Stover
Maize Straw	Bamboo pellet	Paper Dust
Peanut Husk	Grain, such as maize	Pine Sawdust
Sawdust	Rice Bran	Rice Husk