Production plant in Israel to feed more than 10,000 cattle daily

In 2010 the Israeli company Ambar Feed Mills signed a contract with the Tatoma Group to build a production plant for total mixed rations (TMR) in order to supply its customers and associates with 5,000 feed rations for dairy cows in the north eastern region of the Negev Desert.

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Dosage station hoppers, molasses tanks and fodder silos.

The plant comprised a MT-25 horizontal mixer, a weighing belt, two feed conveyors, an auger feeder and other miscellaneous equipment enabling different rations for loading pre-mixes and to discharge them at the end of the process to be programmed through a control unit.

After commissioning, the plant was found to have made savings of up to 10% in raw materials due to more accurate loading and the reduction in waste and its transport.

Customers also experienced substantial improvements in the homogeneity and stability of the ration and, as a consequence, it had a direct impact by increasing milk production and dramatically reducing the percentage of metabolic problems. These excellent results obtained by its clients caused an increase in demand which led to a second extension in 2011 consisting of the addition of three new feeders to the original system.

Finally, this year a new extension has been made to produce 10,000 daily rations and cater to the demand generated by new customers eager to improve their production rates. This latest expansion included the addition of a new mixer and a set of auxiliary belts to work in parallel with the existing one hence improving response to any breakdowns on any of the systems.

In addition to rations for dairy cows and up until the latest extension, Ambar Feed Mills had also been producing 4,000 cattle rations daily and 1,000 for fattening calves, meaning that current capacity to supply these types of ruminants exceeds 10,000 rations daily.

Ambar Feed Mills is the largest and most advanced feed mill in Israel. Founded in 1961, it belongs to Granot Central Cooperative Ltd, which is one of the largest cooperatives in the world created by the kibbutz movement in Israel to facilitate centralised procurement.

Ambar Feed Mills has two production plants, Ambar North in Gan Shmuel and Ambar South in Dvira. Its annual production in animal feed is about one million tons.

Weighing conveyor and ingredient hoppers.

Plant operation

The plant is the result of Tatoma's experience of over 30 years in the design, construction and commissioning of 'Total Mixed Ration' (TMR) type feeding systems for ruminant livestock both in trailed and self-propelled machinery and more than 20 years building these industrial facilities, with over 100 units on the market of various sizes and configurations.

The operation is based on rations programmed into the automatic system for

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Horizontal mixer with anti-dust covering.

Two horizontal mixers in tandem.

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plant control, requiring only two people to operate it and who are in charge of both the filling of the different feeders and choosing the rations comprising a number of ingredients in specific proportions depending on the type of animal (milk production, heifers, beef cattle).

These ingredients are placed in the feeder according to their physical characteristics; hence feeds and supplements are placed in silos, molasses and whey in tanks, fibrous components in the feeders with movable floors and milling at discharge points. Granular components are placed in feeders fitted with augers and in tall silos.

After choosing the recipe the individual discharge takes place of the set amount of each of the fibrous and granulated ingredients onto the weighing belt.

These loading systems have an accuracy of around two per thousand, i.e. about three times higher than using front loading systems where accuracy is down to the operator and as this is manual it is usually no better than six per thousand.

The belt than discharges over the mixer and simultaneously the feed, supplements, whey and molasses on it are discharged, as the silos and containers holding these components have their own system of measurement, either by weight or by volume.

Finally, they are then mixed for the designated time and subsequently discharged and prepared for transport either by bulk delivery trucks or pressed in different sized bales.

The total cycle time of a mixture is between 10-15 minutes, depending on the composition and amounts of the ration. The availability of a second mixer means these production cycles can be overlapped and thus increase plant productivity.

This is how the plant in Israel has gone from 45 tons per hour with a single mixer to 75 tons per hour after undertaking an extension.

Substantial improvements provided by this system

- One of the most important goals from the nutritional point of view is to make every mouthful taken by the cow at the trough have the same characteristics and nutritional requirements as that planned by the dietician. Only through this mixing method (automatic) is it possible to ensure that the programmed ration is that consumed by the cow.
- Using the automatic system reduces leftovers and waste percentages of ingredients from 2% to 0.2% in grains and concentrates, from 5% to 1% in hay and from 7% to 3-4% in silage (real results achieved at the Ambar-Dvira Feeding Centre).
- The operators' tasks are significantly reduced as they can control the operation of the system from the loading vehicle through a computer (laptop), thus enabling savings in hours of work and other tasks performed by operators when using previous systems.
- From an economic point of view the increase in the profits of the company, obtained essentially by the savings in losses, waste, labour, fuel, and moving machinery depreciation is estimated at over 45% for a 24-month period.
- The farmer receives the same heterogeneous ration daily, which is the same colour and fibre size, helping prevent spikes or fluctuations in milk production, i.e. if the programmed operation is the same, milk production will only vary according to lactation periods or the length of time from calving. ■

Straw dosing system.