

Combustion of alternative pellet in Tomasoni farm



Background

Tommasoni company is a livestock farming in the middle of the Padana plain (Visano - Brescia). The company has got about 400 dairy cows, among which there are many calves fed with formula milk. The preparation of milk requires 85 °C hot water to dissolve the powdered milk; this operation is carried out twice a day. The total production is about 5000 liters of milk per day.

Up to 4-5 years ago, the Tommasoni company used a boiler with a burner fed by heating oil (diesel oil). The burner was then replaced by a new system, developed by Termocabi, fed by pellets made of agri-residues and alternative materials.

The choice of changing the burner was mainly do to the increase in fossil fuel prices and by the opportunity of finding cheap pellet in the local market.



Internal view of farming

Alternative pellet

The pellets used by Tommasoni are made of various agricultural residues produced in the region, mainly straw, corn stalks and scraps of grain corn. The choice of the type of pellet is made on the basis of its price and quality. The price can range from 130 €/t, for low-quality pellets, up to

190 €/t for a mixture of pellets, made of wood and agricultural residues.

Typically, the purchase of the product takes place in summer, when the price of pellets is much lower than in autumn and winter. The product can be delivered in big bags or in standard bags (15 kg). The bags rarely have labels with enough information on the product quality.



Boiler in the dairy of Mr. Tommasoni.

The pellet, in some cases, has a very high ash content (more than 6%): this can be observed directly after burning, when the system of collecting unburned and ash material is emptied.

Raw material characteristics

PARAMETER	VALUE
Moisture content %	< 10
Heating value MJ/kg	16,9
Ash content %	> 5,0
Ash melting temperature °C	----
Chlorine %	0,08
Sulfur %	---
Nitrogen %	1,2
Cost of material €/t	130 – 190



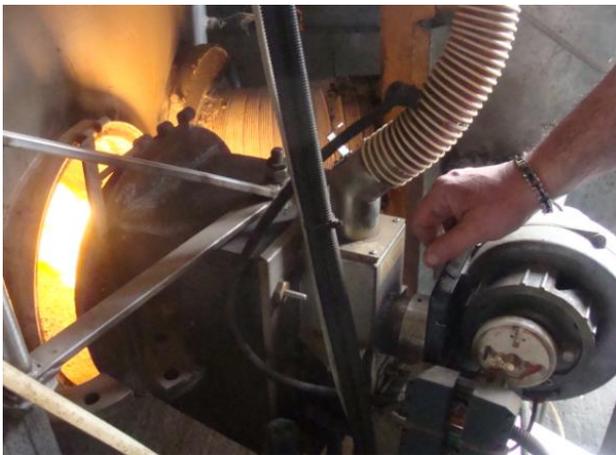
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Boiler and burner

The burner can supply a power of 50 kWh. It was designed to use pelletized materials made of agricultural residue (AGRIPELLETS Model). The burner is a blown air type, with the horizontal flame in a monoblock structure. The burner can expel the ash material continuously as agglomerated, without interfering with the combustion process. This burner system is also able to use other dry and dense biomasses (moisture content lower than 15% and bulk density higher than 500 kg/m³), as grain of maize.



The pellet burner of 60 kWh.

Mr. Tommasoni can easily regulate the combustion of this burner: this is mostly important

when there is a changing of the pellet type. The parameters that can be handled are: the regulation of primary air, the feeding speed of the burner and the discharge mechanism of combustion ashes. This last system is particularly important to avoid the formation of inorganic aggregates, especially in case of low temperature melting ash.

Producers comments

The use of the pellet burner has determined significant cost savings. The initial investment was related to the replacement of the burner (a few thousand euros). In the last year the price of diesel oil has increased from about 60 c€/kg to 90 c€/kg.

The boiler has not shown particular problems and the adjustment of the burner is quite simple and doesn't take a long time. On average, each year are consumed about 25 tonnes of pellets. The space available for storage in the farm is essential to make purchases of pellets during the period when the price is lower.

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