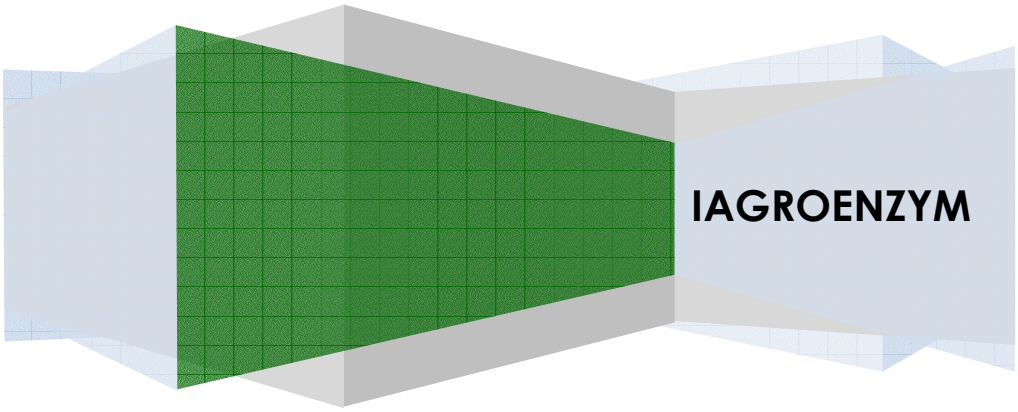
IAGROENZYM

Silage is the technique that enables the storage of fodder or green with semi drying in order to use them during the periods in which there is adequate production of forage crops. In this way you can maintain year-round livestock feeding a more rational, beneficial and full of nutrients. The benefits of this method of conservation are many, but in recent years have also seen negative phenomena related to conservation is not always adequate, just consider the phenomenon of mycotoxins already addressed earlier.
Rewards may be represented by the possibility of appealing and succulent fodder in winter or during summer drought, and this is a big advantage for the exploitation of animals for milk, since the action of green forage diet stimulates and supports the production of dairy , best of food based only on dry forage.

A second benefit is the ability to keep in time crops (maize and grass), which are not affidable. Fresh or wilted forage that is introduced after chopping constipated, well, inside a silo or vertical trench is subjected to a series of biochemical transformations, which modify the organoleptic and makes them capable of long term storage. These transformations take place within the plant cells and are represented by breathing and by various enzymatic processes, which are added to the fermentation produced by microform.
The work and the vitality of the microform are essential to ensuring a healthy and well-preserved silage, they depend on the type of feed, oxygen and temperature of the silage mass. The biochemical phenomena, which is subject to the silage, develop according to the sequence described below:

1. Breathing: The green fodder or slightly faded manifest when dell'insilamento, a strong respiratory activity and oxygen present in the mass is consumed rapidly, with production of CO2. This phenomenon depends on the metabolism of soluble carbohydrates, such as mono- and disaccharide sugars contained in plant silage.

2. Enzyme autolytic phenomena: Again, these are changes that take place in the cells of plants preserved, which hydrolyze nutrients, catabolize. These degradation phenomena involved mainly to carbohydrates and proteins. The carbs in a first phase, breath until the oxygen is present, but then the sugars undergo alcoholic fermentation and glycolysis, with production of alcohol, acetaldehyde, pyruvic acid and lactic acid.

In this phase, lactic acid is very important for the conservation of fodder, and not because it acidifies the environment allows the development and proliferation of bacteria that produce abnormal fermentation or dangerous to health dell'insilato and animals. In addition to sugars, protein also affected the enzyme activity, from which it derived peptides and amino acids, which in turn can undergo deamination or decarboxylation.

3. Bacterial fermentation: Represent an essential factor of the transformations that occur during silage and is due in great part to the success of their preservation, the loss of nutrients and the likelihood that the organoleptic characteristics of the forage give more or less satisfactory. The bacteria involved in this phase are acidophilus bacteria, the butterfat and the tumor. Bacterial fermentation is in turn divided into:

a. acid: It takes place in parallel with the respiration and lasts two or three days. It is due to the 'activities of a very diff use of microorganisms, coliforms and streptococci aerobacter.

b. acidosis: E 'typical and essential for the conservation dell'insilato and starts the second day by filling the silos and constipation. Develops gradually with increasing intensity. If dell'insilato corn is reached after 15 - 20 days that the critical degree of acidity, corresponding to 7 - 12% lactic acid on the dry fodder, with pH values from 4.0 to 4.2. This will ensure the basic conditions dell'insilamento namely the inhibition of butyric acid and proteolytic bacteria and phenomena deamination, which occur at the hands of their enzymes, which escape the amino group - NH2 from organic substances. Nell'insilamento alfalfa and tririfogli, the field of acidity ranges from 4.5 to 5, in this case, if it fulfills the conditions necessary for good conservation, micro-butter fail to colonize because they enter the mass of silage in activity when the pH is higher than values of 5.2. The agents of lactic fermentation are microorganisms of the genus Lactobacillus species with L.plantarum and L.brevis. In silage treated with solutions of mineral acids predominant species L. pentoaceticus that tolerates pH below 4. Diff use in many other species silage are L.casei and Streptococcus lactis.

c. butyric: In addition to acidogenic microorganisms useful silage, there is a group of bacteria, designated Butyric fermentation activity of which is clearly harmful. These spore-forming bacteria or facultative aerobic-anaerobic bacteria belonging to the genus Clostridium, which is widely present in soil and feces of herbivorous animals. These bacteria are able to metabolize sugars disaccharides, monos butyric acid and lactic acid producing H2 and CO2.

d. Proteolytic: Microorganisms that hydrolyse the proteins and amino acids are attacking many, and some of them are the source of products such as amines, ammonia, skatole, phenols, H2 S or the results of putrefaction. Microorganisms proteolytic belong mostly to the clostridia, such as Clostidium sporogenes, the Clputrificum, the Proteus, Bacillus subtilis and B. mesentericus. The activity of this microflora is essentially tied dell'insilato acidity and activity of lactic acid bacteria, because at pH 4.5 proteolytic microorganisms can not multiply and survive. The proteolytic action, and even putrefaction is exerted by certain molds (Penicillium, Aspergillus, Mucor) operating in aerobic environment in the areas dell'insilato surface or in the air where penetration is favored by conditions of keeping unsuitable.

From the comments above is how complex is the techniques of preservation of a good silage. It is in fact a biological ecosystem alive, which is preserved optimally when it has a proper development of acidity as a result of fermentation. The heat produced in the trenches, if properly evaluated, can become an important indicator of the course of fermentation. Conservation dell'insilato can be divided into 6 stages, all distinct for different microbiological activity and the corresponding development of pH and temperature of silage.

Phase I : is represented by the first days of ensiling, activity, oxygen consumption and the residual enzyme. Life processes of plants do not go to camp, but continues after harvest and influence the initial stages of conservation. Respiration of plant cells continues even after the closure of the trench, until the complete exhaustion of O2 present in the silage mass. This process, as we have seen, leads to the metabolism of sugars in the forage, with the formation of CO2, H2 O and a rise in temperature. Thus we have a net intake of energy, which contributes to acidification of the silage mass, because the pH values remain almost unchanged on the value 6.5.

Phase II : begins the first few days after fermentation. The consumption of oxygen in the first phase represents a form of natural selection of bacterial strains that are found on the surface of the forage just fine. Most microorganisms can not multiply in the absence of O2, the latter would suffer early in the competition of facultative aerobic bacteria, enterobacteriaceae, which are capable of converting sugars into dell'insilato organic acids (acetic, formic, lactic acid and butyric acid), CO2 and H2. Begins at this stage an initial acidification of the forage, which brings the pH from a starting value of about 6.5 to a value below 5.5.

Phase III: in the time of the first week we have the onset of lactic fermentation, which, through the fermentation of sugars into lactic acid, allow to achieve pH values prohibitive for the development of most bacteria butterfat or degradation. Lactic acid is in fact a stronger acid of vinegar, which is produced by enterobacteria. The development of lactic fermentation takes place already at pH 4.5 and heat production is 37 - 40 ° C.

Phase IV: After the first week and for at least two others, one has the prevalence of fermentation homolactic, with the progress of acidification dell'insilato. In this phase, at the expense of others, omofermentanti lactic acid bacteria, ie microorganisms that use sugars of plant cells to produce lactic acid, without production of secondary metabolites and without production of new heat. We are approximately one week dall'insilamento and the mass of forage finished produce heat. In measuring the heat dell'insilato must remember that the heat produced during fermentation can exceed 15 ° C (heat of silage) and that this value is to add up the initial temperature of the silage mass.

Phase V: static phase of fermentation. The fermentation homolactic bring the pH to levels that (in Silomais reach values lower than 4.0 to 3.8) to inhibit any microbial activity, including that of the same omofermentanti lactic acid bacteria. Here begins the longest life of silage.

Phase VI: breathing on the front of the cut. A few days before being administered to animals silage back in contact with the air and at this stage many yeasts and molds and can contaminate the ground, transforming the residual sugar and lactic acid in ethanol. Under these conditions, degradation can assist in the development of cutting heat on the front with a loss of dry matter. Intervene only in the latter phase is insuffi cient to obtain good silage: we need action from the start, with enzymes and microorganisms.

To reduce the heat in the different phases and govern the fermentation, it is essential to intervene during the collection of fine. At this stage it should be distributed carefully on every discharge of fine, roughly every 15 cm in height, a dose of enzyme mixture and selected microorganisms in order to anticipate the possible fermentation homolactic.
The technique of inoculation on silage microorganisms and enzymes, increases the concentration of microorganisms and catalyze the acidification of the silage mass, so as to increase the rate of initial acidification and ensure that action to the end user 's silage. The action inoculation, during filling dell'insilato, a specially designed enzyme mixture containing amylase, cellulase, protease, phosphorylase, lactase, lipase, betalactamase and microorganisms of the genus Lactobacillus, can get many benefits, including the build up of lactic acid. Furthermore, the inoculum, speaking against the proliferation of some species of Clostridia that metabolize amides and amino acids reduces the production of ammonia. Enzymes and lactic microorganisms can also be used on the front cutting dell'insilato after opening.

This treatment may have an action against the muff ee yeasts that develop in contact no air. Action inoculum, used since the beginning of training dell'insilato, has an activity that persists even during cutting.

It allows for orderly development of lactic acid, aerobic stability and at the same time, inhibits the growth of yeasts that, during the unveiling dell'insilato, metabolize the few remaining sugar, raising the temperature, leading to loss of dry matter and nutritional value. With less fungal contamination can be obtained even fewer mycotoxins.

In this regard, we recall that only a few develop a mechanism of detoxification enzymes, which counteracts the metabolic action of mycotoxins. For example, the enzyme glutathione S-transferase involved in the production of a metabolite that hinders the action of Aflatoxin B1, seriously threatening the health of people eating meat or milk from livestock fed with contaminated fodder.

Proper preservation of forage, guarantees the quality of nutritional values, quality and thus a higher yield of milk and meat.