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Effects of Microbial Inoculants and Dry Matter Content at Harvest on the Fermentation, Aerobic Stability and Digestion of NDF of Two Corn Silage Hybrids.

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The objective of this study was to compare the effects of microbial inoculants on the ensiling process of two corn silages ensiled at different DM contents. Two hybrids (DeKalb 6339 and Pioneer 33A88) were harvested at four DM contents (30, 32, 37 and 42%) and untreated or treated with 11CFT (Pioneer Hi-Bred International, Inc., Johnston, IA) at a rate of 1×10^5 cfu of *L. buchneri* PTA6138 and 1×10^4 cfu of *L. casei* PTA6135 or with Buchneri 500 (Lallemand Animal Nutrition, Milwaukee, WI) at a rate of 4×10^5 cfu of *L. buchneri* 40788 and 1×10^5 cfu of *P. pentosaceus* 12455 per g of wet forage. Approximately 600 g of fresh forage was ensiled in vacuumed and heat sealed bag silos (quadruplicate per treatment) and stored for 150 days. At the time of opening, a representative sample was taken and analyzed for fermentation end products, microbial populations, aerobic stability and nutritive value. NDF digestion was determined using dried samples ground through a 6-mm screen in a Wiley mill, weighed into in situ bags and incubated in the rumen of fistulated steers for 48 h. There were hybrid \times DM \times treatment interactions for all fermentation end products except lactic acid, numbers of lactic acid bacteria and aerobic stability. Over all hybrids and DM contents, corn silages treated with Buchneri 500 and 11CFT had higher ($P < 0.0018$) concentrations of acetate when compared with untreated silages (1.52 and 1.55 vs. 1.05% of DM). The same response was observed for 1,2-propanediol (0.57 and 0.52 vs. 0.24% of DM) and the number of lactic acid bacteria (8.22 and 8.01 vs. 6.30 log₁₀ CFU/g). Buchneri 500 and 11CFT silages were also more stable when exposed to air (291 and 269 h for silage temperature to reach 2°C above ambient vs. 203 h for control) and had fewer yeasts at the time of opening (0.84 and 0.76 vs. 2.35 log₁₀ CFU/g in untreated silages). Inoculation did not statistically improve NDF-D for either hybrid, but when combined as a main

effect there was a trend ($P < 0.1026$) for silage treated with 11CFT to be more digestible than untreated silage (45.49 vs. 43.96 % of NDF).

Using molecular techniques to identify and differentiate bacterial species and strains used in corn silage inoculants.

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One of the problems encountered when analyzing the bacterial profiles found in silage inoculants is that they may contain a mixture of closely related species and strains which may exhibit similar biochemical properties. However, the advancement in molecular techniques has led to the development of a number of methods which enable this problem to be overcome. In this study, a DNA fingerprint technique was developed to identify species of bacteria present in commercially available silage inoculants; group specific primers were used to identify isolates of *Lactobacillus buchneri* from these samples, and RAPD-PCR was used to differentiate closely related isolates of this organism and compare them to *L. buchneri* NCIMB 40788.

Commercial preparations (5) which contained *L. buchneri* were plated out. DNA was extracted from each plate and amplified. The resulting amplicons were separated by TTGE and the band positions compared with known standards (*L. buchneri*, *L. casei*, *E. faecium*, *L. plantarum*). In most instances, the package label corresponded to what was found in the packet except one sample which was supposed to contain *L. buchneri* did not appear to contain any viable cells of this organism as seen by the absence of a *L. buchneri* band. Further attempts to use *L. buchneri* specific primers on this preparation also did not produce a reaction, confirming this.

To differentiate between strains of *L. buchneri*, single colonies were isolated from each commercial sample. Each isolate was Gram stained and those which resembled *L. buchneri* in morphology were selected, their DNA extracted and amplified using specific primers. Those which gave a positive reaction were then subjected to RAPD-PCR using 5 different primers and compared with the corresponding fingerprint of *L. buchneri* 40788. All were different to 40788 however, some of these new isolates only exhibited minor differences to each other, indicating that they were very closely related. Thus a rapid method has been developed which can enable the identification and differentiation of different species of lactic acid bacteria and strains of *L. buchneri* commonly used in corn silage inoculants.

Can bacterial inoculants improve the quality of rust-infested corn silage?

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Southern rust is an aggressive disease caused by *Puccinia polysora* which may provide ideal conditions for the growth of undesirable opportunistic fungi that adversely affect forage quality. Little is known about the effects of the disease on the nutritional value of corn silage. Less is known about whether microbial inoculants can improve the quality of rust-infested corn silage. This project aimed to determine how inoculant treatment affects the fermentation, nutritive value and aerobic stability of corn silage containing varying levels of southern rust infestation. Corn plants with no rust (NR), or medium (MR), or high rust (HR) infestation were harvested at random locations from a field, chopped and ensiled alone (Control) or after applying 1×10^6 cfu/g of *L. buchneri* (NCIMB 40788) and *P. pentosaceus* (NCIMB 12455). Each treatment was prepared in quadruplicate in 20 l mini silos and ensiled for 97 days. As the level of rust infestation increased, concentrations of DM and NDF increased, whereas DM digestibility decreased by up to 13%. Control, HR silages also had lower NDF digestibility (NDFD; 36.2% of DM) than Control, MR (39.8%) or NR silages (38.1%). Inoculation increased the NDFD of NR (43.4%) and MR silages (45.7%) but not HR silages (33.0%). Concentrations of lactate and VFA decreased with increasing rust infestation in NR silages, but this trend was absent in inoculated silages. In HR silages, inoculation reduced mold counts (3.4 vs. 0.95 log cfu/g), increased aerobic stability by 75% (77.3 vs. 44 h), and prevented production of aflatoxin (5.2 vs. 0 mg/kg). The concentration of aflatoxin in uninoculated, HR silages exceeded action levels stipulated by the US Food and Drug Administration. In conclusion, rust infestation reduced the nutritive value and fermentation of corn silage. Inoculation reduced adverse effects of rust infestation on the fermentation, increased NDFD of NR and MR silages, and decreased mold growth, aerobic spoilage, and aflatoxin production in HR silages.

Control of *E. coli* O157:H7 in corn silage with inoculants under anaerobic and aerobic conditions.

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The aim was to determine if bacterial inoculants could eliminate *E. coli* O157:H7 (ECOL) in contaminated corn silages and if inoculants transferred antibacterial activity to silages. Chopped corn forage was ensiled in triplicate after treatment with: 1) distilled water (control); 2) 5×10^5 cfu/g of ECOL (EC); 3) EC and 1×10^6 cfu/g of *Pediococcus pentosaceus* (NCIMB 12455) and *Propionibacterium freudenreichii* (R2453) (EC+BII); 4) EC and 1×10^6 cfu/g of *Lactobacillus buchneri* (NCIMB 40788) (LB; EC+LB); 5) EC and 1×10^6 cfu/g of LB and *P. pentosaceus* (NCIMB 12455) (EC+B500). Silos were opened after 3, 7, 31, and 82 d and analyzed for pH and ECOL counts as well as VFA, lactate, and aerobic stability on d 82. By d 3, all silages had pH was < 4 (SE = 0.33; $P = 1$) and pH did not increase subsequently; therefore ECOL was not detected in any silage. The Kirby-Bauer disc diffusion test showed that all pure cultures of inoculants had pH-independent antibacterial activity against ECOL but inoculated silages did not, suggesting that ECOL elimination was mediated by pH reduction. Inoculation with LB resulted in less lactate (SE = 0.31; $P < 0.05$), more acetate (SE = 0.35; $P < 0.05$), and greater aerobic stability (SE = 7.1; $P < 0.05$) versus control. Day-82 silages were reinoculated with EC at silo opening (immediate) or after 144 h of exposure (delay) and ECOL were enumerated 24 h later. All immediately reinoculated silages had low pH values (< 4) and no ECOL 24 h later. Control, EC, and EC+BII silages reinoculated after the delay had relatively high pH values (4.71, 5.67, and 6.03) (SE = 0.74; $P < 0.05$) and ECOL counts (2.87, 6.73, and 6.87 log cfu/g) (SE = 1.4; $P < 0.05$), whereas those treated with LB had low pH values (< 4) and undetectable (EC+B500) or low ECOL counts (1.96, cfu/g; EC+LB). Inoculants did not enhance elimination of ECOL during ensiling, but *L. buchneri* inoculants increased stability and eliminated or inhibited ECOL in aerobically exposed silages.

Should forage samples be shipped to analytical labs in plastic or paper bags to accurately assess mold and yeast counts?

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The objectives of this study were: 1) to determine the effects of shipping forage samples in paper or plastic bags on mold and yeast levels; 2) to determine the effects of temperature on yeast and mold levels in samples packaged for shipping; and 3) to characterize actual temperature fluctuations in samples shipped during different seasons. Samples of corn and hay crop silages were collected, thoroughly mixed and divided into sub-samples which were assigned randomly to treatment based on a 2 × 4 factorial design with packaging: paper or plastic and temperature: 35°C (simulating warm conditions), 22°C (simulating room temperature), 4°C (simulating cool shipping conditions or refrigeration) and -20°C (freezing) as variables. Shipping samples in plastic bags kept cool minimized the changes in viable counts compared to fresh samples (>10⁴ reduction in count, compared to >10⁶ increase at higher temperatures). The dramatic differences seen even under the most optimum conditions used in this study questions the accuracy of yeast and mold counts obtained from shipping silage samples to commercial laboratories. To evaluate seasonal influences on temperature fluctuations during actual shipment of forage samples, four forage samples were shipped with temperature data loggers to a commercial laboratory in spring, summer, fall, and winter using three shipping methods: 1) FedEx Priority; 2) US Postal Service Priority Mail; 3) US Postal Service Priority Mail + coolant pack. Samples shipped FedEx were received within 16 hours and remained relatively cool. Samples shipped USPS were received within 3 days and samples shipped with coolant packs remained cooler for approximately 24 hours.

Nutritive value of corn silage inoculated with *Propionibacterium acidipropionici*, alone or in association with *Lactobacillus buchneri*.

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The objective of this trial was to estimate the nutritive value of corn silage treated with *Propionibacterium acidipropionici*, alone or in association with *Lactobacillus buchneri*. The forage was harvested at 35.4% mean dry matter content, and sixteen experimental silos (20-L plastic buckets) were filled according to the following treatments: control, forage without microbial additive; LB, forage inoculated with *Lactobacillus buchneri* (5×10^4 CFU/g – wet forage); PP, forage inoculated with *Propionibacterium acidipropionici* (1.2×10^5 CFU/g – wet forage); and LB+PP: forage inoculated with a mix of *L. buchneri* (2.5×10^4 CFU/g – wet forage) and *P. acidipropionici* (9×10^4 CFU/g – wet forage). The LB showed higher ($P < 0.01$) dry matter content than the control (36.15% vs. 34.88%) treatment. There was no difference among all treatments for ash (4.88 to 5.08% DM), crude protein (3.76 to 3.79% DM), neutral detergent fiber (43.44 to 48.73% DM) hemicellulose (24.84 to 26.55% DM), acid detergent fiber (21.09 to 24.60%), cellulose (22.23 to 25.59% DM), acid detergent insoluble nitrogen (7.00 to 7.72% total N), ether extract (2.53 to 2.71% DM), starch (22.27 to 26.93% DM) and in vitro true organic matter digestibility (63.04 to 65.51% DM) content. The microbial additives evaluated had no effect on the nutritive value of corn silages, either applied exclusively or associated.

Fermentative parameters of corn silages inoculated with *Propionibacterium acidipropionici* or in association with *Lactobacillus buchneri*.

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The purpose of this study was to evaluate the fermentative parameters of corn silages inoculated with *Propionibacterium acidipropionici* or associated with *Lactobacillus buchneri*. The forage was harvested at 35.4% mean dry matter content, and sixteen experimental silos (20-L plastic buckets) were filled according to the following treatments: control, forage without microbial additive; LB, forage inoculated with *Lactobacillus buchneri* (5×10^4 CFU/g – wet forage); PP, forage inoculated with *Propionibacterium acidipropionici* (1.2×10^5 CFU/g – wet forage); and LB+PP: forage inoculated with a mix of *L. buchneri* (2.5×10^4 CFU/g – wet forage) and *P. acidipropionici* (9×10^4 CFU/g – wet forage). There were no differences ($P > 0.05$) for the pH (3.59 to 3.61) and acetic acid (1.05 to 1.24% DM) content across the treatments. The lactic acid ((3.71 vs. 1.09, 1.64 and 1.72% DM) and butyric acid (0.76 vs. 0.36, 0.22 and 0.16% DM) content were higher ($P < 0.01$) for the control than the LB, PP and LB+PP, respectively. The PP treatment showed the highest ($P < 0.01$) ammonia-N content (13.04 vs. 9.43, 8.18 and 5.83% total N, for the LB, LB+PP and control, respectively). The inoculants were effective in decreasing the butyric acid content of the corn silages. However, the inoculant *Propionibacterium acidipropionici*, when applied exclusively, was not efficient in lowering the ammonia-N content.

Effects of *Propionibacterium acidipropionici* and associations on the aerobic stability of corn silage

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The objective of the study was to evaluate the effect of *Propionibacterium acidipropionici* alone or associated with *Lactobacillus buchneri* on the aerobic stability of corn silages. The forage was harvested at 35.4% mean dry matter content, and sixteen experimental silos (20-L plastic buckets) were filled according to the following treatments: control, without additive; LB, *Lactobacillus buchneri* (5×10^4 CFU/g-wet forage); PP, *Propionibacterium acidipropionici* (1.2×10^5 CFU/g-wet forage); LB+PP: *L. buchneri* (2.5×10^4 CFU/g-wet forage) and *P. acidipropionici* (9×10^4 CFU/g-wet forage). There were no differences ($P > 0.05$) between treatments for the time of aerobic stability (44.06 to 45.38 hours), maximum temperature (38.25 to 39.88°C), time for maximum temperature (62.81 to 64.63 hours), accumulated temperature from 0-5 days (2910.6 to 3368.2°C) and from 0-10 days (5396.6 to 6641.0°C), dry matter losses from 0-5 days (2.92 to 7.83%) and from 5-10 days (7.92 to 13.14%), total dry matter losses from 0-10 days (12.70 to 19.69%), organic matter losses from 0-5 days (4.29 to 11.47%) and from 5-10 days (11.46 to 20.66%) and total organic matter losses from 0-10 days (21.11 to 23.64%). The pH increased ($P < 0.01$) from the day 0 (3.59-3.61) to the day 10 (6.43-7.07) in all treatments. The association LB+PP maintained the ash content during 0-5 days ($P > 0.05$), but increased ($P < 0.05$) on day 10 as occurred to the other treatments. The *Propionibacterium acidipropionici*, alone or in association with *L. buchneri*, did not improve the aerobic stability of corn silage.

The effect of *Lalsil Fresh LB* on the fermentation quality and digestibility of TMR potato hash silage in lambs

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Total mixed rations containing 80% potato hash (a by-product containing 150 g/kg DM) were ensiled with or without a heterolactic inoculant, *Lalsil Fresh LB-LFLB*- (*Lactobacillus buchneri* NCIMB 40788, Lallemand SAS, France) in 210 L drums for 3 months. A 10 g of the inoculant was dissolved in 2 L water (4 h before application) and sprayed at 2 L per ton of fresh TMR to obtain 6×10^5 cfu/g fresh material. The control silage was produced by spraying 2 l of water per ton of TMR. The silage was analyzed for DM, pH, lactic acid, acetic acid, butyric acid and NH₃. Aerobic stability test was done by exposing silage to air for 5 d (30°C) and pH, yeast counts and CO₂ production were determined. Silage was fed to 16 lambs (20 ± 0.152 kg BW) with 8 replicates per treatment and trial lasted for 63 d. Compared to the control, LFLB treated TMR had a higher ($P < 0.05$) DM, lactic acid and acetic acid and a lower ($P < 0.05$) pH, butyric acid and NH₃ contents. When exposed to air, lower ($P < 0.05$) yeast counts (4.67 vs. 6.59 log¹⁰) and CO₂ (0.27 vs. 2.36 g/kg DM) were obtained in the LFLB treatment compared to the control. Lambs fed LFLB silage had higher ($P < 0.05$) intake of DM, OM, energy, fibre and N compared to the control. Furthermore, the digestibility of DM, OM, energy, fibre and N was improved with LFLB inoculation. It was concluded that LFLB is effective in producing a better quality by-product silage as indicated by improved fermentation and aerobic stability of the silage. Lamb performance was better in the LFLB treatment compared to the control.

Effects of ensiling whole crop maize with or without *Lalsil fresh LB* on the fermentation, aerobic stability and growth performance of lambs

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Whole crop maize (288 DM g/kg) was ensiled with or without a heterolactic inoculant, Lalsil Fresh LB-LFLB- (*Lactobacillus buchneri* NCIMB 40788, Lallemand SAS, France) in 210 L drums for 3 months. A 10 g of the inoculant was dissolved in 2 L water (4 h before application) and sprayed at 2 L per ton of fresh maize to obtain at least 3×10^5 cfu/g fresh material. The control silage was produced by spraying 2 l of water per ton of maize. The silage was analyzed for DM, pH, lactic acid, acetic acid, butyric acid and NH₃. Aerobic stability test was done by exposing silage to air for 5 d at ambient temperature (30°C) and CO₂ production was determined. Silage was fed to 16 lambs (20.60 ± 0.618 kg BW) with 8 replicates per treatment and trial lasted for 63 d. Compared to the control, LFLB treated silage had a higher ($P < 0.05$) WSC, lactic acid and acetic acid and a lower ($P < 0.05$) pH, butyric acid and NH₃ contents. Lower CO₂ production (2.81 vs 7.36 g/kg DM) was obtained in the LFLB compared to the control. The growth performance of lambs was improved ($P < 0.05$) by inoculating silage with LFLB silage as indicated by higher ($P < 0.05$) feed intakes observed, higher final body weights and average daily gains (189 vs. 154 g/d) compared to the control. It is concluded that LFLB inoculation improved both the silage quality and lamb growth performance.

The use of an oxygen barrier film and *Lactobacillus buchneri* to preserve alfalfa bale silage at high and low dry matter contents

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Introduction Alfalfa is difficult to ensile in wrapped bales, both at a low ($< 300 \text{ g kg}^{-1}$) and at a high dry matter (DM) contents ($> 600 \text{ g kg}^{-1}$). The objectives of this research were to test a new oxygen barrier (OB) stretch film with a 18-fold lower oxygen permeability than the polyethylene (PE) stretch film commonly used on farms in combination with *Lact. buchneri* inoculum (NCIMB 40788, Lallemand SA, France, theoretical rate 10^6 cfu g^{-1} fresh forage) and to determine their effects on the microbial status, the surface covered by mold, and the fermentation characteristics of alfalfa bales. Field experiment was conducted near Turin (Italy), on first cut of alfalfa harvested at very low (LDM) and very high DM (HDM) contents (around 250 g kg^{-1} and 650 g kg^{-1} , respectively). The herbage was ensiled in round bales, without a LAB inoculant and with a *Lact. buchneri* inoculum. Four bales were randomly wrapped for each treatment with six layers of either conventional PE or OB film. After 12 mo of conservation, the LDM silages treated with *Lact. buchneri* had a lower pH, higher concentrations of lactic and acetic acids, a lower concentration of ammonia nitrogen, and a lower percentage of the bale surface covered by mold than the untreated silages. The OB film significantly reduced the ammonia nitrogen and surface covered by mold in LDM silages, when used in combination with the *Lact. buchneri* inoculum, whereas it was not effective when used alone. In the HDM silages, the OB film significantly reduced the pH, increased the production of lactic and acetic acid, reduced the ethanol concentration, the presence of mold cfu and the surface of the bale covered by mold, whereas the *Lact. buchneri* inoculum had no effects. It has been concluded that *Lact buchneri* inoculum and a stretch film with low oxygen permeability represent valuable tools to improve fermentation and conservation quality of alfalfa ensiled in round bales at very high or very low DM concentrations.

The effect of *Lactobacillus buchneri* on Chemical Composition and on Aerobic Stability of Corn Silage

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Corn silage is a substrate of high nutritive value for development of opportunistic microorganisms, responsible for aerobic deterioration. Heterofermentative bacteria *Lactobacillus buchneri* was tested in order to improve aerobic stability of silages by reducing yeast and mold growth. The aim of this trial was to evaluate the effect of increasing *L. buchneri* doses on chemical composition and aerobic stability in corn silage in post-opening period. The treatments were: increasing *L. buchneri* doses (NCIMB40788 strain) applied on corn hybrid Maximus: SLB - control (no inoculated); LB1 – 5×10^4 , LB2 - 1×10^5 , LB3 - 5×10^5 , LB4 - 1×10^6 CFU/g of forage. Plastic buckets with 7 L capacity were used like a silo, sealed and stored at room temperature. After 100 days of fermentation, the silos were opened, spoiled forage discarded, and the remainder was homogenized, placed in plastic buckets, and maintained in a closed place at room temperature. Silage temperature was measured every half hour by a data logger inserted in the center of mass during the aerobic exposition (0, 4, 8 and 12 days). Room temperature was measured by data logger distributed near of the experimental silos. Samples were collected to evaluate pH values, acetic acid determination was done by gas chromatography and the counting of yeasts and mold was made in acidified potato agar (Difco). Experimental design was completely randomized with three replicates in a split-plot, doses in parcels and time of aerobic exposition in sub parcels. Data were submitted to variance and averages analysis and treatments comparison by Tukey test at 5% probability. In silos opening, pH values did not differ significantly among silages. During aerobic exposition, the pH values increased, possibly by the lactic acid consumption by aerobic microorganisms and volatilization of acetic and propionic acids. Treatment LB3 and LB4 showed lower pH values at 8th day of aerobic exposition. Acetic acid concentrations were higher in treated silages and decreased along the aerobic exposure. Microorganisms occurrence data in the silos opening (time 0) showed lowest yeast number in the

treated silages. However, only the treatments LB2, LB3 and LB4 showed lower yeast counts at time four ($P < 0.05$). After this period the yeast number did not differ ($P > 0.05$). *L. buchneri* utilization was efficient in the control of molds ($P < 0.05$). Control of yeasts and molds in treated silages can be explained by presence of acetic and propionic acid which has antifungal effect. It was observed that inclusion of *L. buchneri* improved ($P < 0.05$) aerobic stability of corn silage. The treatment LB3 was stable for a longer time (223.9 h). The elevation of temperature and its maintenance over time are important indicators of aerobic deterioration, and reflect of yeasts and molds growth. The *L. buchneri* was effective in protecting corn silage against undesirable microorganisms in laboratory conditions. All doses, specially 5×10^5 CFU of *L. buchneri*/g silage, reduced the number of yeasts and mold and improved aerobic stability.

The Effect of *Lactobacillus buchneri* on High Moisture Corn Grain Silage Chemical Composition, and Aerobic Stability

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The high moisture corn silage is being increasingly used, allowing farmers to store product with lower losses and advance the maize harvest time. Sanitary quality of high moisture corn silage should be emphasized, since the presence of undesirable microorganisms can affect its quality. Strategies such as use of heterofermentative bacteria inoculants have been studied as an attempt to improve aerobic stability of silages by reducing yeasts and molds population. The objective was to evaluate the effect of *L. buchneri* doses on chemical composition and aerobic stability of high moisture corn silage in the post-opening. The treatments were increasing *L. buchneri* doses (NCIMB 40788 strain) applied on the high moisture grains of hybrid corn Maximus: SLB - control (no inoculant); LB1 - 5×10^4 , LB2 - 1×10^5 , LB3 - 5×10^5 , LB4 - 1×10^6 CFU/g of corn ground. Plastic buckets with a 7L capacity were used, sealed and stored at room temperature. After 130 days of fermentation, the silos were opened, discarded the spoiled material, the remainder was homogenized and placed in plastic buckets, wrapped, and stored in a closed room at room temperature. Temperatures were read every half hour by a data logger inserted in the center of mass during the aerobic exposition (0, 4, 8 and 12 days). The room temperature was measured by means of data logger distributed near to experimental silos. Samples were collected to evaluate pH values, acetic acid determination was done by gas chromatography and the counting of yeasts and mold was made in acidified potato agar (Difco). The experimental design was completely randomized with three replicates in a split-plot, with the doses in plot and the time of aerobic exposition in sub-plots. Data were submitted to analysis of variance and averages of treatments compared by Tukey test at 5% probability. In silos opening, the pH values did not differ significantly among treatments ($P > 0.05$). During aerobic exposition, the pH values increased, possibly by the consumption of lactic acid by aerobic microorganisms and loss of acetic and propionic acid by volatilization. The pH values of treatments LB3 and LB4 were

lower. Concentrations of acetic acid did not differ significantly among treatments ($P > 0.05$); this result disagrees with those found in the literature, as one of end products of fermentation of *L. buchneri* is acetic acid. The development of microorganisms at opening of silos was not affected. Consequently there was no significant difference in the counting of yeasts colonies among treatments. However, the silages treated with doses from 5×10^5 CFU/g of silage had lower counts of yeasts until the fourth day of aerobic exposition ($P < 0.05$). On the fourth day of aeration the count of molds was lowest for all silages treated, in later days the counts did not differ significantly among treatments ($P > 0.05$). Although no significant differences were found among treatments for acetic acid concentration, the silages treated were positive in the control of mold and yeast until the fourth day of aerobic exposition. It was observed that inclusion of *L. buchneri* did not affect significantly ($P > 0.05$) aerobic stability of high moisture corn silage, but numerically had improved in the silages treated. The aerobic instability for inoculated silages was higher than 87.5 hours. The treatment LB3 was stable for longer time (115.8 h). Although use *L. buchneri* had not shown significant results, it is a satisfactory trend in the control of the aerobic stability of high moisture corn grain silage in laboratory conditions. The doses of *L. buchneri*, in general, have been effective in controlling yeast and molds, especially the doses with 5×10^5 and 1×10^6 CFU/g of silage.