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ABSTRACT BOOK





Objective: Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* complex bacteria. Domestic goats are particularly susceptible to this disease, which is mainly caused by *Mycobacterium caprae* and *Mycobacterium bovis*. Caprine TB is endemic in Spain and causes relevant economic losses on the goat industry. Furthermore, infected goats pose a risk of infection of other animal species such as cattle or wildlife, and humans. However, goat herds are not yet subject to a national eradication program, except for those epidemiologically linked to cattle.

Vaccination of livestock against TB has been proposed as an alternative or complementary control strategy to strict test-and-slaughter when this is not affordable. This study was conceived as an autovaccine proof-of-concept to assess the efficacy of a heat-inactivated *M. caprae* (HIMC) vaccine in goats experimentally challenged with the same strain of *M. caprae* used to prepare the vaccine and to compare it with goats vaccinated with a previously characterized heterologous vaccine based on heat-inactivated *M. bovis* (HIMB).

Materials and methods: Twenty-one goats were divided in three groups of seven each: one vaccinated with 1ml containing 10^7 colony forming units (cfu) of HIMB, another with the same dose of HIMC, and the remaining goats were maintained as unvaccinated controls. At 7 weeks post vaccination all animals were challenged with approximately 10^9 cfu of *M. caprae* by the endobronchial route in the Biosafety Level-3 facilities of IRTA-CReSA (Bellaterra, Catalonia, Spain). After challenge, clinical signs were followed-up daily, rectal temperature and body weight were recorded weekly, and blood samples were collected every two weeks for immunological assays. All goats were euthanized at 9 weeks post challenge. Gross pathological examination, analysis of lung pathology using Computed Tomography, and bacterial load quantification by culture and qPCR were carried out. All procedures were approved by the Animal Welfare Committee of the *Generalitat de Catalunya* (Project No. 10794) in conformity with the European Union legislation (86/609/EEC, 91/628/EEC, 92/65/EEC and 90/425/EEC).

Results: Unvaccinated goats showed significantly lower mean body weight cumulative increase since week 3 and high-

er rectal temperature since week 2 ($P < 0.05$) when compared to HIMB and HIMC. At the end of the study, both vaccinated groups showed a significant reduction of the number of affected lobes and the volumes of lung mineralization and lesions in pulmonary lymph nodes ($P < 0.05$), as well as a lower proportions of animals with extrapulmonary lesions ($P < 0.05$), compared to unvaccinated controls. Interestingly, only HIMC vaccinated goats showed a significant reduction of the volume of lung lesions and bacterial DNA load in pulmonary lymph nodes compared to unvaccinated goats ($P < 0.05$). A summary of the main *postmortem* results is shown in Table 1.

Conclusion: The results indicated that homologous vaccination with HIMC conferred protection of goats against *M. caprae* challenge compared to unvaccinated goats. Moreover, HIMC also induced a mild reduction of TB pulmonary pathology and bacterial load compared to goats vaccinated with the heterologous vaccine (HIMB). Therefore, this study encourages to carry out further large-scale trials to assess the efficacy of autovaccines under field conditions.

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Keywords: Tuberculosis, Goats, Autovaccine, *Mycobacterium*, Small Ruminants.

AH-P36

Descriptive study of cow culling in dairy herds in Uruguay

Benjamín Doncel Díaz¹, Federico Giannitti², Carlos Lemaire³, Franklin Riet Correa⁴.

¹Plataforma de Investigación en Salud Animal, Instituto Nacional de Investigación Agropecuaria (INIA), Estación Experimental INIA La Estanzuela, Ruta 50 Km 11, 70000, Colonia, Uruguay. ²Universidad Nacional de Colombia, Sede Bogotá, Bogotá, Colombia; ³Plataforma de Investigación en Salud Animal, Instituto Nacional de Investigación

Table 1. Pathological and bacteriological results for each treatment group at 9 weeks after *M. caprae* challenge

Group	No. of affected lung lobes: Mean (95% CI)	Volume of lung lesions: Mean cm ³ (95% CI)	Volume of lung mineralization: Mean cm ³ (95% CI)	Volume of lesions in pulmonary lymph nodes: Mean cm ³ (95% CI)	No. of animals with extrapulmonary lesions	Bacterial DNA load in lymph nodes: Mean Log ₁₀ CFU equivalents (95% CI)
Control (N=7)	6.3 (5.1-7.4)	197 (96-297)	28.9 (2.5-55.4)	59 (32-86)	7/7	3.5 (2.7-4.3)
HIMB (N=7)	4.1 (2.5-5.8) ^a	138 (50-226)	8.6 (1.2-16.1) ^b	22 (6-37) ^b	4/7 ^c	2.9 (2.2-3.6)
HIMC (N=7)	4.0 (2.6-5.4) ^a	98 (25-170) ^b	7.4 (0.4-14.3) ^b	40 (3-76) ^b	4/7 ^c	2.8 (1.1-4.4) ^b

^a $P < 0.05$, one-way ANOVA with *post hoc* Tukey test; ^b $P < 0.05$, Kuskal-Wallis test with *post hoc* one-tailed Mann-Whitney test; ^c $P < 0.05$, Fisher Exact's test.



Agropecuaria (INIA), Estación Experimental INIA La Estanzuela, Ruta 50 Km 11, 70000, Colonia, Uruguay; ³Centro Regional de Experimentación Agropecuaria (CREA), Colonia, Uruguay; ⁴Plataforma de Investigación en Salud Animal, Instituto Nacional de Investigación Agropecuaria (INIA), Estación Experimental INIA La Estanzuela, Ruta 50 Km 11, 70000, Colonia, Uruguay. Programa de Pós-Graduação em Ciência Animal nos Trópicos, Faculdade de Veterinária, Universidade Federal da Bahia (UFBA), Av. Adhemar de Barros 500, Ondina, Salvador, Brazil.

Objectives: The culling of dairy cows causes economic losses and negatively impacts on the growth of the herd. Early cow culling reduces cow longevity. This study sought to calculate the culling rates and identify the causes of culling of cows in dairy herds in Uruguay.

Materials and Methods: A prospective observational longitudinal study was conducted from June 2019 to May 2020 in 12 dairy farms in the dairy basin of Uruguay in the Departments of Colonia and San José. These departments account for 39.9% (177,085) of the total cows in the country and 50% (1,845) of all Uruguayan dairy farms. Farms were selected through stratified sampling representative of the distribution by size of the herds in Uruguay. Of the 12 farms six had a population between 51-199 cows, five had 200-500 cows and one had >500 cows. The populations varied between 74 and 740 cows. Monthly visits were made to each farm and information was collected in a Microsoft Excel Database. The data collected included the inventory of milking cows, drying cows, replacements. The information on date of calving and drying of the cows was collected. From the culling cows, cause and date of culling, calving number, days after calving, number of cows in early lactation <100 days in milk (DIM), in mid-lactation 100-200 DIM and in the late lactation >200 DIM were collected. Cow culling was classified in 3 destinations: A- sale for slaughter, B- mortality, and C- sale for milk production at other dairies. The sale for slaughter destination was further subdivided in six categories: 1-udder problems (mastitis and conformation), 2-reproductive problems (infertility and abortions), 3-lameness (foot and trauma in regions other than the foot), 4-other diseases than those mentioned above, 5-low production (old cows or end of productive life and cows with 1 or 2 calvings without evident disease), and 6-behavior and type.

Results: The average population in the 12 herds in the year of study was 3,126 cows. A total of 721 cows were culled. The overall culling rate in the 12 herds on average was 23.1% (721), ranging from 17.4% to 35.8%. The sale for slaughter was on average 18.1% (565) and ranged from 10.4% to 27.1%. Average mortality was 4.5% (141) and ranged from 1.1% to 8.1%. The sale of cows for milk production at other dairies was 0.5% (15), varying from 0% to 10.1%.

The reasons for culling cows in the 12 herds were: udder problems (32.2%, 12.5%-41.3%), reproductive problems (29.3%, 16.7%-58.5%), lameness (4.6%, 0%-11.1%), other diseases (4.7%, 0%-14.3%), low production (6.8%, 0%-20.8%), and behavior and type (0.8%, 0%-4.2%). The most frequent diseases (clinical diagnosis) other than udder problems, reproductive problems and lameness included leukosis, rumen overload, paratuberculosis and eye tumors. The sale for slaughter due to reproductive problems, udder problems, lameness and other diseases accounted for 90.3% (n=510) of the sales.

According to parity, 37.7% (n=266, range: 22.2%-62.5%) of cows sold for slaughter and dead cows had more than three calvings, 24.4% (n=172, range: 11.1%-36.8%) were first calving cows, 21% (n=148, range: 8.3%-44.4%) were cows with two calvings and 17% (n=120, range: 7.9%-26.3%) were cows with three calvings. According to lactation stage, 39.7% (n=280, range: 22.7%-62.5%) of the culled cows were in late lactation, followed by 32.3% (n=228, between 16.7%-45.6%) in early lactation, 17.6% (n=124, range: 11.3%-26.8%) in mid lactation and 10.5% (n= 74, range: 0%-22.5%) were dry cows.

Conclusions: This work shows that to reduce the culling rate of dairy cows in Uruguay, it is important to implement programs to improve herd reproduction and to control mastitis, lameness and other diseases. To achieve this, it is necessary to develop diagnostic, surveillance, research, and extension programs for farmers.

Keywords: Cow, culling, dairy, Uruguay.

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Results of an investigative on-line audit of farms with abomasal bloat in dairy calves

John F Mee¹, Ian Kerin².

¹Teagasc, Animal & Bioscience Research Department, Fermoy, Ireland, Republic of Ireland; ²Grove House, Rushane, Kilmamona, Co. Clare, Republic of Ireland.

Objective: The objective of this study was to characterise calf management on dairy farms where calf abomasal disorders were reported.

Materials and methods: Farmers who attended a calf health stand during an Open Day at the Irish national dairy research centre in 2021 and self-reported abomasal disorders in calves (n=17) were asked to provide contact details for subsequent follow up. A previously designed abomasal disorder audit questionnaire (57 questions; open/closed, free text) was entered into SurveyMonkey and forwarded to the farmers' email addresses. In total 16 farmers responded to the survey; 13 had problems with calf abomasal disorders, 3 did not or did not complete the questionnaire and were excluded.

Results: The majority of affected farms had spring-calving herds (n=9 farms) and weaned less than 100 calves (9). The abomasal disorders reported were bloat (11), abomasal/intestinal torsion (5) and abomasal ulcers (2) and combinations of these disorders. In all farms heifers were affected, in some cases bull calves were also affected (6). Affected calves were generally un-weaned (12), less than two months old (11) and Holstein-Friesian (8). The estimated range in proportions of affected calves and deaths associated with abomasal disorders were 2-10% and 0-8%, respectively. The majority of cases occurred in February and March (13). On the majority of farms, these problems were first noticed within the last five years (11). While veterinary practitioners were called to these problems on the majority of farms (11), laboratory results were rarely available (4) and necropsies were rarely conducted (2).