



Genetic and Factory Factors About the Variation in the Production of Leche from a Double Proposition

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Abstract

Obtain bovines that express adaptability and efficient productions in tropical environments, is the object in double proposition gauging investigations. Finally, to evaluate the genetic and non-genetic effects that affect the variation in leche production in double proposal vacuums, 3722 analyzed lactose flies were analyzed in 244 days (P244) of 1334 vacancies, belonging to a finca ubicada in La Ceiba, Trujillo State. Model I, allowed to evaluate the non-genetic and genetic effects affecting the P244 variation, establishes as effective effects: month of party (MP), year of party (AP), share of party (EP), number of parties (NP)) and racial group (GR) and como effects: padre, madre de la vaca y residual, are evaluating and working on an analysis of variance using the mixed model methodology of the SAS[®] statistical package. Model II determines the components of (co) variance, genetic and non-genetic parameters, using a unified animal model with the conjunction of MTDFREML programs. Considering the effective effects, those that result in significant results ($P < 0.05$) of model I: (AP), (EP), (NP) and (GR). Considered as powerful effects: the animal, the permanent atmosphere of the vaca and the error. If we estimate the additive genetic variance (σ^2_a), proportions of the total phenotypic variance (σ^2_F), it calculates the permanent ambient variance of the vaca (σ^2_{Ap}), residual variance (e^2), index of herence (h^2) and coefficient of repetition. For P244 the adjusted weight of 1562.26 ± 150.06 kg. All effective effects result significantly ($P < 0.05$), excluding the part of the part. Estimates of the univariate model of σ^2_a , σ^2_{Ap} , e^2 , σ^2_F , h^2 and ri for P244 fueron: 55970; 101127; 118896; 275993; 0.20 and 0.56, respectively. P244 is highly affected by environmental and genetic factors.

Keywords: Double Prosthesis Ganadería; Leche Production; Genetic Effects; Genetic Parameters; Hernia Index

Introduccion

The recent need to produce food on a regular basis and quality is a constant preoccupation with researchers oriented to agricultural and peculiar frameworks with productive fines. Transcending the times and advances of the various technical techniques of the season has given rise to the establishment of specific races for the production of leche, as these races are originals of climates

with climates and climates introduced into climates tropical does not reflect the different productive and reproductive returns of its sites of origin [3]. The Republic of Cuba initiated in the year 60 a program of cruelty for children to take part in planned gatherings between individuals and semen of probate of the Republic of Canada. The cruising between, among the individuals with superior values for the production of leche and other characteristic in-

terests of economic interest as a result of the origin of the breed Mambi de Cuba, there are 305 lactic acid diuretics between 2086 kg and 2106 kg [13]. In the Federal Republic of Brazil, studies show that the Guzerat breed has great adaptability and capacity to produce efficient and profitable ways [5,9]. Do Nascimento y col. [8], indicating its indications that quintessential vacations and most cases require a lactation production media for lactation days of 9.14 kg and a duration of lactation period of 282.96 days. As well as individuals with genetic major values for initial leche production, major values for total leche production [8]. The Bolivarian Republic of Venezuela, while the rest of the Latin American lands are home to native descendants of descendants of bovine primates that breed in American animals, is home to the Criollo Limonero. With the passage of time and the best of the productive techniques surging the Carora race, the cual has shown weight production of 2689.4 kg in lactations of 296.2 days and service period of 139.8 days [28]. Similar values were obtained in study on the production of leachas in the Carora breed and Holstein x Brahman breeds, between 2948 and 3033 kg of leachates in lactated animals up to 244 days [27]. accounted for the native animals of descendants of the first bovines that breed in American animals, this is the case of the Criollo Limonero breed. With the passage of time and the best of the productive techniques surging the Carora race, the cual has shown weight production of 2689.4 kg in lactations of 296.2 days and service period of 139.8 days [28]. Similar values were obtained in study on the production of leachas in the Carora breed and Holstein x Brahman breeds, between 2948 and 3033 kg of leachates in lactated animals up to 244 days [27]. accounted for the native animals of descendants of the first bovines that breed in American animals, this is the case of the Criollo Limonero breed. With the passage of time and the best of the productive techniques surging the Carora race, the cual has shown weight production of 2689.4 kg in lactations of 296.2 days and service period of 139.8 days [28]. Similar values were obtained in study on the production of leachas in the Carora breed and Holstein x Brahman breeds, between 2948 and 3033 kg of leachates in lactated animals up to 244 days [27]. 8 days [28]. Similar values were obtained in study on the production of leachas in the Carora breed and Holstein x Brahman breeds, between 2948 and 3033 kg of leachates in lactated animals up to 244 days [27]. 8 days [28]. Similar values were obtained in study on the production of leachas in the Carora breed and Holstein x Brahman breeds, between 2948 and 3033 kg of leachates in lactated animals up to 244 days [27].

On various occasions he has opted for the massive importation of live animals with miras to increase national productions, which in the majority of cases he fractured, one times to be reborn of noble breed adaptable to tropical conditions and others by discount of the producers benefiting from the importation programs, the requirements of maneuvering and feeding. The adaptive capacity, high costs and risks associated with the import, its limiting factors to present within the animal import processes.

In Venezuela there are mixed bovines *Bos indicus* x *Bos taurus* are distributed in different locations of the national geography and that contribute with 90% of the total production of leche and 45% of carne [20]. For the year 2017, publications of the Characterization of the National Gatherer of the Integral Program of Desarrollo Lechero (PIDEL) reaffirm that the dual-proposition systems contribute significantly to the production of double-edged iron and wood, given the duality of the dual proposition, aggregates 76% of leche production units and 10% of carne production units [18]. Amplia is the information that is found in the literature related to bovines producers of double proposition [18,21]. No obstante.

Materials and Methods

The Valde Verde Production Unit is located in the municipality of La Ceiba, parish of Santa Apolonia, Estado Trujillo. Located with 360 ha of surface area and located in the northeast of the State of Trujillo.

The climate is ubiquitous in the zone of life corresponding to tropical human forest (Bht) [10], presents an approximate height of 300 msnm, with a mean temperature of 28 °C and an annual media precipitation between 900 and 1,300 mm. The lluvias regimen is characterized by being bimodal, presenting throughout the year, with maximum peaks and minimum precipitation values.

The Rebaño was conformed to double propositional hemispheres, including crucifixion between individuals.

The semi-intensive feeding system, based on pastas such as: tanner (*Urochloa radicans*), guinea (*Panicum maximum*), estrella (*Cynodon plectostachyus* and *Cynodon nlemfuensis*) *Brachiaria mutica* and *Echinochloa polystachya*, in addition to supplementation libitum a todos los animales. The bakers will receive a supplement with a balanced diet diary of 0.5 kg up to their diet. The vacas

receive the order supplement with a balanced diet of 18% crude protein (PC) for vaca that weighs 2 kg, depending on the availability in the market and the costs of the same.

Implement the diary orders, complete the mechanical order with the support of the becerro, followed by a restrained restraint for 30 min. The production of leche fueron obtenidas from the fifth day of production after the party.

The bovine hemorrhoids are first served during pregnancy at 3.25 years of age, with a weight between 320-340 kg. The artificial insemination is used for all the vacations in service. The detection of this cell is carried out with the help of a toroidal retrieval or androgenized vacancy. All bovine hemorrhoids that have not been treated before three (03) consecutive inseminations, pass through a natural control, for a period that oscillates the three cells, from which no contractions are eliminated. In the form of routine, gynecological evaluations are performed before and after the service.

Description of the dates and models used

Based on the information retrieved from the 244-day lactation data registers, obtained from the GanSoft® Information Registry Information Program, version 6.1, in the final stages of analyzing the obtained information, a calculation was made in give the identity of the animals, the date of birth, calculate the oath in months and years as part of the register of initiation of lactation, as well as the month and year of birth, culmination of lactation, racial composition, number of lactancias, production slides, total leche production, production adjusted to 244 slides, identification of the father and the mother of the vaca. The passage of the leche tanto del ordeño de la mañana (02:00 am) como en la tarde (02:00 pm), fue realized a conventional balance and a twelve with the production obtained by each vacancy of the order. The summary of both travel (monthly and late) is the value of monthly, weekly and quintessential travel records for each entry entered in the data base. Methodological dichas, adjusts to the recommendations described by Vaccaro [22], for the register of double bovine leeches production in the tropics. In addition, it distributes frequencies and basic statistics with SAS [19], to assist in the detection of abnormal data. for the register of lech bovines production of double proposals in the tropics. In addition, it distributes frequencies and basic statistics with SAS [19], to assist in the detection of abnormal data. for the register of lech bovines production of double proposals in the trop-

ics. In addition, it distributes frequencies and basic statistics with SAS [19], to assist in the detection of abnormal data.

It has an initial data base of 4968 lactation observations, eliminating 1246 observations by data in its individual register of records, repeated dates and other inconsistencies between the registers, the information eliminated corresponding to the years 1989 and 1995. To contact a base de definos datos de 3722 registros de lactancias correspondiente a 1334 vacas. The table 1 shows the observations used in the various statistical analyzes.

Part years	a	Racial group	a	Part number	a	My part	a
1996	75	1	116	1	775	One	310
1997	167	2	147	2	865	Feb	264
1998	111	3	1667	3	703	Mar	402
1999	169	4	863	4	499	Abr	356
2000	270	5	868	5	335	May	253
2001	256	6	61	6 months	545	Jun	248
2002	264	-	-	-	-	Jul	312
2003	271	-	-	-	-	Ago	241
2004	249	-	-	-	-	Sep	298
2005	237	-	-	-	-	Oct	375
2006	227	-	-	-	-	Nov	387
2007	277	-	-	-	-	Dic	276
2008	355	-	-	-	-	-	-
2009	374	-	-	-	-	-	-
2010	338	-	-	-	-	-	-
2011	82	-	-	-	-	-	-
Total	3722	-	3722	-	3722	-	3722

Table 1: Observations used in statistical analysis.

Statistical models

The fines of conjugation, the effects that have significant significance in the variation of leche production adjusted to 244 days, construct the final mathematical models and define the non-genetic effects including the estimation of the variance components and genetic parameters, conducted a variance analysis using mixed models and the maximum restraint vertebrate (REML) methodology of the SAS statistical package [19]. If we consider how effective

we are: the oath in our party, our party, our party, racial group and the number of lactancias of the holiday. As a result, the power of the vaca, the mother of the vaca and the residual is included.

The components of (co) variance and genetic parameters were estimated, using a single animal model in conjunction with the MTDFREML (Multiple Trait Derivative Free Restricted Maximum Likelihood) programs described by Boldman and col [4]. Included for the analysis, the resulting effects as significant variance analysis with mixed models.

The statistical models to be used are described in continuation

Model 1

Analyze the non-genetic effects: year, month, part number, part number and the genetic effect of the racial group on the variation of leche production.

$$Yijklmnop = \mu + ai + mj + tk + vl + nm + gn + \beta_1 pijklmno + eijklmnop$$

Dónde

$Yijklmnop$ = production of milk by lactation adjusted to 244 days of the vaca "o" cuyo parto ocurrió en el año "ai" y en el mes "mj", hija del toro "tk" y de la vaca "vl", al número de parto "nm", a la edad "pijklmno" y grupo racial "gn".

μ = theoretical media of the population.

ai = effect of year of part "i" (i = 1996,..., 2011).

mj = effect of the month of part "j" (j = January, February,..., December).

tk = power of the pad "k" (k = 1, 2,..., 203), normal, independently distributed with zero zero and variance σ^2t .

vl = effect of the matrix "l" (l = 1,2,..., 924), normal, independently distributed with zero zero and variance σ^2v .

nm = effect fijo of part number "m" (m = 1,2,..., 6 or more)

gn = racial group effect (n = g1, g2,..., g6)

1=F1 HOLSTEIN 2= F1 PARDO SUIZO 3=> CEBÚ
 4=> HOLSTEIN 5=> PARDO SUIZO 6= INDEFINIDO

$pijklmno$ = edad de la vaca al parto como covariable, como desviación del promedio.

β_1 = $Yijklmnop$ regressions on vacancy by part of $pijklmno$ ruler.

$eijklmnop$ = residual, normal, independently distributed with zero y and variance σ^2e .

Model 2

To obtain the components of (co) variance, the index of herenia and the proportions of the phenotypic variance that are due to the permanent ambiente of the vaca (c_2) and the residual (e_2), a univariate animal model is used throughout the cycle of programs MTDFREML described by Boldman and col [4].

The final model for the characteristic features:

$$y = X\beta + Za + Wp + e$$

Dónde:

y = observation vector (production of leche adjusted to 244 days).

X, Z, W = known incidence matrices.

β = vector of effective effects.

a = vector of additive genetic effects effects.

p = vector of random effects of the permanent ambiente of the vaca.

e = residual effect vector.

The mathematical hope of the model fue:

$$E [y] = X\beta$$

And the variance

$$V [y] = \text{Var} \begin{pmatrix} a \\ p \\ e \end{pmatrix} = \begin{pmatrix} A \sigma^2_a & 0 & 0 \\ 0 & I \sigma^2_{Ap} & 0 \\ 0 & 0 & I \sigma^2_e \end{pmatrix}$$

Dónde

A = parenthesis matrix I = identity matrix σ^2_a = additive genetic variance

σ^2_{Ap} = permanent ambient variance σ^2_e = residual variance

The heredabilidad fue calculada a partir de la formula siguiente

$$h^2 = \frac{\sigma_a^2}{\sigma_F^2}$$

Dónde:

h^2 = index of heredity σ^2_a = additive genetic variance

σ^2_F = total phenotypic variance

The repeatability is calculated with the following formula

$$r_i = \frac{\sigma_a^2 + \sigma_{Ap}^2}{\sigma_F^2}$$

Dónde

r_i = repetition coefficient σ^2_a = additive genetic variance

σ^2_{Ap} = permanent ambient variance σ^2_F = phenotypic variance

Results and Discussion

The production of leche commedio adjusted to 244 days of the 3722 observations made from 1562.26 with a standing error (et) of 150.06 kg, a minimum value of 18.75 kg and a maximum value of 3741.30 kg, y the unadjusted 1635.29 kg (and = 8.93 kg), the weight production of 244 days reflects superior values (90.26 kg) compared to the values reported in the literature published in the published results. 1472 kg and 244 lactase slides [11,14,17,23-26], very inferior to other reports [12,15]. TABLE II summarizes the values of "F" of the variance analysis regarding the study object variables.

The year of departure has a very significant effect ($P < 0.0001$) on leche production. The best year was 1998 (2059,03 ± 46,01) kg while the most promising productions were reflected in the years 2002 (1512,48 ± 33,77) kg and 2006 (1526,41 ± 36,27) kg to deter-

Effect	GLa	Valor de F	Probability
Year of birth	15	19.50	<0.0001 **
Racial group	5	23.53	<0.0001 **
Part number	5	3.74	0.0022 *
My party	11	1.14	0.3254ns
Edad en meses	1	3.87	0.0492 *

Table 2: Analysis of Variance.

^aDegrees of freedom; ns = not significant; * = significant ($P < 0.05$); ** = very significant ($P < 0.0001$).

mine the difference between the year of mayor and minor production is less than 546.55 kg. These differences can be found in relation to varying climatic factors, changes in the productive mode, failures in the register of information, ambient majorities such as food and mode that significantly affect the production of vacations [8,21].

The racial group effect, highly significant ($P < 0.0001$) in leche production. In literature, tienden to signal major productions for animals ½ European herring sanctuary [26,27]. In the obtained results it is found that the minor production medium adjusted to 244 days increased by the vacancies with mayor and equal proportion Cebú (gr3) with productions of 1498.03 kg. The major values were obtained for vacations with mayor and equal proportion Holstein (gr4) with a premium production adjusted to 244 days of 1805.09 kg (FIG. 1), followed by vacations with mayor and equal proportion Pardo Suizo (gr5) with one production production adjusted to 244 days of 1751.94 kg, showing the difference between gr4 and gr5 of 53.15 kg. Additionally, vacations of the F1 group Holstein (gr1) will show adjusted production results to 244 days of 1748.94. In the case of vacancies with mayor and equal proportion Cebú (gr3) are obtained values by debating the reporters in the literature [6,9]. Increase the reduction of proportions of genes *Bos taurus*, *Bos indicus* significantly influences the production lechera.

The effective part number, significantly affected ($P < 0.05$) the production of leche. If the minor production production is observed in the lot of animals slaughtered in the first batch (1628.87 ± 37.81) kg, the largest production batch is observed in the fifth batch (1729.57 ± 37.12) kg. This difference is due to physiological reasons, while increasing the number of lactants, there is a proportional development of the mammary gland. The minor production

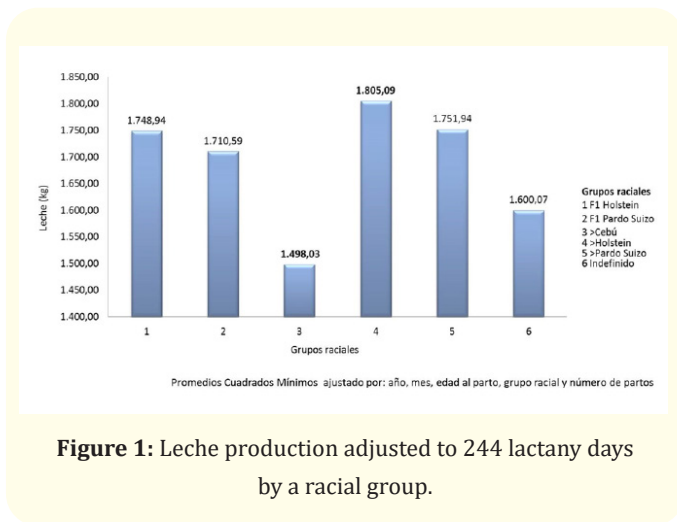


Figure 1: Leche production adjusted to 244 lactary days by a racial group.

of leche observed in the first lactation obesity has a physiological initiation of the mammary system, contrary to the animal only in cremation, where the tiger mammary secretion does not represent the totality of what must be shown to express its maximum productive level.

The effect of my part, no significant manner influence ($P > 0.05$) on leche production. If the production of adjusted adjusted milk is lowered (1641.84 ± 32.17) kg during the month of November and the maximum production of adjusted medium leached (1730.42 ± 35.43) kg during the month of March. The difference between both months is 88.58 kg. Coincide con lo reportado [24,25] en investigaciones realizadas en tropical latitudes. The abundance of pastes in quality and quality, its disposition to the animals at present gives its best nutritional value, associated with a diet regimen, which is uniformly maintained throughout all months, with its exceptions between years, allows deduction of no significance of effect in study.

The effect eded in months, significant manner influence ($P > 0.05$) on leche production. Indicating that it means advancing the age of vacancies the production of gradual manure increases, has a maximum level of production that is increased to 103 months of age, declining progressively, coinciding with [6,13]. Physiologically, the novelty is found in crimson when reproducingly corresponding to its service, maintaining the corporal crimson and accordion of the glamorous mammary has the second part, vacas *Bos taurus*

muestran its first major contractions during active on the other hand the production of leche fue obtenida in vacas of more than 5 lactancias, a pesar de ello is shown that the duration of lactation is reduced in relation to the primeras [8].

Components of variance and genetic parameters

Table 3 summarizes the variance components as well as the estimate of herence index (h2) of 0.20 and repeatability (ri) of 0.56 for leche production. Both indices are located inside the ranges reported in the Holstein specification: (h2) 0.25, (ri) 0.53 [7]; en ganado Guzerat lechero: (h2) 0.23 [16]; en ganado raza Mambi de Cuba: (h2) 0.22 [13]; in ganado raza Gyr: (h2) 0.21, (ri) 0.51 [2]. Very much due to the obtenidos in dual propositions in the Zulia state: (h2) of 0.46 in leached adjusted productions to 244 slides [1], associating these differences in the proportions of genes of specialized breeds of leche dentro del rebaño, jugando un gran papel la genotype interaction x ambiente. Data quality, mathematical model and algorithm for data computing, The repeatability (ri) is estimated for the production of leche (0,56), indicating a positive correlation between successive registers of the vacancy, allowing to decide the return of vacations from their first registers of leche production.

	σ^2_a	σ^2_{Ap}	e^2	σ^2_F	h^2	ri
Leche Production in 244 Days	55970	101127	118896	275993	0.20 ± 0.006	0.56

Table 3: Variancy components and genetic parameters.

^aAdditive genetic variance; permanent ambient variance; ^cVarianza residual; total phenotypic variation; herring index; Repetition coefficient.

Conclusions and Recommendations

The value of the production of leche to 244 days adjusted for the effects of the model I can increase, taking into account the best of environmental factors, favoring the production of wood in quantity and quality, as well as the adoption and implementation of technology strategies in critical epochs of the year.

The P244 variable was influenced by a manner important for environmental factors and the racial group, increments in the degree of song *Bos taurus* to contribute significantly to the increment

of lactate production, without embarrassing environmental effects conditional on productive determinations in epochs.

Genetic effects: part year, part time, month and number of part influencing significant manner ($P < 0.05$) on the variation of leche production adjusted to 244 days in the study.

The value obtained for the index of herenia, indicating that part of the phenotypic variation for the production of leche adjusted to 244 days, is by effect of additive of the genes, expecting a phenotypic response intermediate by unit time to include the production to 244 days in the selection.

The estimated repeatability for leche production adjusted to 244 days indicates a positive correlation between successive registers of the vacancy, allowing the elimination of vacancies from the obstruction of its first leche production registers. Allowing time for the best genetics program.

The maximum value of the productive eda of the vacations is presented as a positive indicator to justify the return of the productive edacity of the vacals or mayors in that eda.

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