

Sustainability Production of Bovinae in Mezquital Valley, Hidalgo, Mexico

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Abstract

Surveys were conducted in Bovinae production units (dairy or meat) in seven municipalities of the State of Hidalgo. The "Exponential non-discriminatory snowball" methodology was used to identify units of production. The questions were formulated using the methodology proposed by the framework for evaluation of systems of management incorporating indicators of sustainability (MESMIS), which integrates and analyzes the sustainability in three dimensions. In general, responsible for the bovine production units are the owners, with an age of 50 years old on average, are of the male gender and have devoted to milk production or fattening of steers through the empirical knowledge, learning from the family and based on watching their animals, the home in which they live is own the majority of respondents Agriculture is the main livelihood of which depend on a good number of families and develops own plots and ejidos, the level of education is very low, although most can read and write; on average the lands have a dimension that ranges from 1 to 3 hectares. He accommodation of the animals is da mainly in corrales elaborated by them own producers, which are deficient in materials and lacking of ceiling and floor; and in some cases not have with them conditions favourable carry to out the processes of production. The main breeds that are used for the production of milk are spigots of Holstein and Jersey. For cycles of fattening the animals used are spigots of the races Charoláis and Swiss from local markets and in some cases from other States, they also have the production of sheep and goats. The main activities reported, the production of milk for sale, is but also includes consumption and the production of bulls and/or completed calves.

Keywords: sustainability, production bovine milk, production bovine of meat

Introduction

Sustainable development is defined as one that "meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (Anonymous, 2016), this concept found its roots in a report by the World Commission Environment and development of the United Nations (commonly known as the "Brundtland Commission"), plus it marks a radical change in the concept of "development" that had been used in the early 50's, so the development will involve not only growth but also a need to preserve natural resources and also encourage the development of human resources. In Mexico it was until 2007 that environmental sustainability was addressed in the

National Development Plan (NDP 2007-2012) which has too close a relationship with the international definition, which is defined as "the efficient and rational management of natural resources to improve the welfare of the present population without compromising the quality of life of future generations" (Ahumada et. al., 2012). Currently, various methods for assessing the sustainability encompassing social, environmental and economic factors in agricultural production systems through different forms of weighting and analysis are known (Ku et. Al., 2013), one of these methods is the framework for Evaluating Management Systems Incorporating Sustainability Indicators (MESMIS), derived from analysis Assessment framework Sustainable Land Management, known as FESLM, this framework was proposed by the United Nations Food and agriculture Organization (FAO), has an integrative approach and has been used in many works in Latin America as it is cyclical, flexible and participatory (Sanchez, 2010). In this methodology, you have to take into account the regions as problems that can interfere with the development and sustainability of production units, which allow designing sustainable alternative proposals of natural resources are identified.

The state of Hidalgo is located in 8 place in milk production nationwide and is one of the leading producers of meat, generating significant revenues from these activities. In this paper some, productive and environmental through surveys, in cattle production units located in 7 municipalities in the state of Hidalgo social variables were evaluated, allowing understand and evaluate the sustainability of the same.

Methodology

Location of Bovinae Production Units

The state of Hidalgo, Mexico has the following coordinates: 21 ° 24 'north, 19 ° 36' south, 97 ° 58 'east and 99 ° 53' west, is located within three physiographic provinces: Sierra Madre eastern, northern coastal plain of the Gulf and the Neovolcanic (INEGI, 2011). The selection criteria for municipalities where the research was conducted was that at least one producer of this municipality has participated in training by the Agricultural Development Center of the State of Hidalgo (CEFOAH); being selected from the

following: Actopan (20° 16'05"N, 98° 56'39"O), Alfajayucan (20° 24'35"N 99° 20'58"O), Almoloya (19° 42'12"N, 98° 24'12"O), Cardonal (20° 36'45"N 99° 07'00"O), Mineral de la Reforma (20° 04'21' 'N; 98° 41'47"O), San Salvador (20° 17'02"N 99° 00'49"O) and Zempoala (19° 54'56"N, 98° 40' 12"O) (INEGI, 2013).

Data Collection

a non-probability sampling called "snowball not exponential discriminatory" (Illenberger & Flötteröd, 2012) was used to interview 10 heads of bovine meat and milk production units in 7 municipalities of the State of Hidalgo (Actopan, Alfajayucan, Almoloya, Cardonal, ore from the reform, San Salvador and Zempoala). The questions made is made considering the methodology of the frame for the evaluation of systems of management incorporating indicators of sustainability (MESMIS), establishing is in attributes that should have a management sustainable (Masera et. to the., 1999). The interviews were conducted by trained personnel to avoid tripping on the implementation of surveys and results. Each of the managers of the production units were interviewed within the Bovina production facilities, answered several questions with the pollster according to what was observed without the respondent gave this information.

Analysis of Data

The information generated from the surveys is transcribed to a worksheet, Microsoft Office Professional Plus 2010, was subsequently analyzed using PASW Statics 18 (2009) program in Two Steps Clusters mode.

Results and Discussion.

Spaces Where the Bovinocultura Is Developed

The area of production bovine is is formed by saws, plateaus, Plains, canyons, hills and valleys, with elevations of 3350 meters above sea level, approximately. The production of meat and milk is conducted on soils with the following characteristics: Phaeozem (PH) 35.84%, Leptosol (LP) 28.76% and Vertisol (VR) 9.08% (INEGI, 2013). The average annual precipitation is of 796.9 mm and the average annual temperature is 18.2 °C (CONAGUA, 2013). No one can speak of a climate specific in the region, since it is very contrasting, regions with a humid semi-warm climate with rains throughout the year ACf 13.31%, temperate subhumid with rains in summer can be found C (w) 31.47 29.65% and semidry temperate (BS1k) %. In terms of vegetation, forests, jungle, scrubland, grassland and land are to develop agriculture (INEGI, 2013)

General Data

With the data of the surveys found that the grounds used by the bovine production units were 1 to 3 hectares, mostly, the producers are the owners (80% is own and 20% is rented). Only a 30% of them productions leverage them pastures native for power of them animals in the time of rains, since this power is insufficient for the diet of them animals, by which, complement it power with Stover of corn cultivated in the area and some legumes as the alfalfa, which is cultivated in land Ejido. Heads of cattle production units

Responsible for the production units are mostly masculine gender, which will have dedicated most of his life to the production of milk and cycles of fattening, it could also be determined age/school relations, which show a very narrow, this relationship mode 30% of respondents aged from 40 to 49 had a highest level of schooling compared to those who had ages of 50 in forward which only attended the education basic primary, and some of them not had a level school. As mentioned previously, the activities are developed mostly by men except at 10% where a woman was responsible for activities relating to the production of milk. It is important to highlight that the majority of production and cycles of fattening is developed by men.

Knowledge about their production systems has been due to the time that has been devoted to the development of the same, through the empirical knowledge, either by observation of their animals over time and by transfer of knowledge of their past generations, since they were forced to work on the production of milk or meat from an early age as it was, most of the producers not requested advice from an experienced technician or any medical veterinary zootechnician, general advice or chosen queries were for a medical service or insemination of their cows and failing for the application of medicines or vaccines, in cases where the animals were already ill. Responsible for production units are responsible for bring the economic livelihood to their homes; 90% of respondents unknown functions and existence of the CEFOAH and only 10% of those interviewed, asked for counseling and/or consulting to this institution.

A 60% of them surveyed gets their income economic through it agriculture and a 40% by other activities, in addition to mentioned get income extra by the sale of calves fat and milk.

Production Data

Among races that exploit production dairy are crosses of breeds Holstein (80%) and Jersey (20%) and for fattening cattle, breeds that use are Charolais (80%) and Swiss (20%), these animals are purchased from local markets in animals and in some cases transferred from Zacatecas and San Luis Potosí. 100% of the producers mentioned have not increased their livestock inventory in the cycle of fattening, compared with milk production, where replacements are important and retain all their young females. It is worth mentioning that the producers also have a good number of goats and sheep.

Type of Accommodation

100% of animals remains confined in makeshift pens, since due to the lack of resources by producers, themselves made their pens with re-used materials. He 90% of them surveyed not has light in them pens, the floor is of Earth, the material of them walls can get to be metallic and wood, them ceilings are of blade and only a small part of the poultry is is with shadow, in general is could observe that the facilities are deficient.

Management of the Excreta

Regarding the handling of manure 100% of those surveyed stacks them, some were use to fertile their crops.

Feeding

100% of the managers use rations of fattening made diets, which are based on: stubble of corn, ground corn, sorghum, wheat, barley and byproducts such as poultry manure, bread and biscuit. In terms of milk production, feed is limited to stubble of corn, native grasses, alfalfa and oats. Despite not knowing the exact portions of animals, producers know the limits of each input that can be added or not to their diet, which, empirically measure the food which you will manage the cattle and in other productions, the forage is given free demand.

Permanent and Temporary Workforce

100% of those responsible for production systems takes care of all the tasks of their production systems, they do not hire external staff to work on their farms and therefore labor is merely family, services that have producers are minimal and only have trucks for transportation of their animals in the local markets of the region. The sale of animals might be walking from farm and local markets, the sale of milk is limited only by foot from farm. 70% of the producers occasionally received advice from a medical veterinarian zootechnician and 30% received around-the-clock technical support for all matters related to the exploitation. It is important to mention that 100% of the producers does not register any, which limits their possibilities for growth in the region. Fits mention that a 40% is updated in topics related with them cattle, already is by meetings with others producers or talks with neighbour and a 30% by the visit occasional of a technical agricultural. The main problems facing producers are technical, followed by economic problems and finally problems relating to the infrastructure that possess. 90% of the producers does not belong to any association of cattle, due to the ignorance of the same (60%) or because they have no interest in partnering (30%); only 10% is associated with a group of producers.

Strengths and Weaknesses of the Detected Subsystems

Family Subsystem:

Internal Strengths: those responsible for the production units mostly own their land, they have dedicated themselves from very small of milk or cycles of fattening of steers, labor is generalized to family.

Internal Weaknesses : the majority of those responsible are men with 50 years of age on average.

External Opportunities : extras receive income for activities that derive from agriculture.

External Threats : schooling levels are very low.

Agricultural Subsystem:

Internal Strengths : they have land of at least 1 to 3 hectares, where cultivated their forage intended for the feeding of the animals, the treatment given to the sewage goes directly to the fertilization of crops of their plots.

Internal Weaknesses : planting is temporary, which limits the production of forages

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Subsystem livestock:

Internal Strengths : producers make milking their animals, the most important product in terms of milk production is local selling it, besides consumption; as fattening cycle, they get fat cattle for sale in farm gate or local markets, also they have a number of heads of sheep and goats. The water supply in the pens is through domestic outlet.

Internal Weaknesses: facilities where animals are housed are not favorable for optimal development of the animals, no record is kept, in which to observe the development of animals and traceability, have no immunization schedule established in dairy production no mastitis is diagnosed, they do not have service improvements or production systems.

External Opportunities: producers tend to receive counseling from agricultural and animal husbandry veterinarians technicians, selling their products is farm gate and in some cases local markets in the region.

External Threats:The technical problems facing producer despite having received some counseling, are financial problems and also infrastructure and inadequate facilities in general producers are not associated because they know where associate, play against urbanization and population growing, what requires producers to develop agricultural activities away from the population.

Conclusions

In the municipalities of Actopan, Alfajayucan, Almoloya, Cardonal, Mineral de la Reforma, San Salvador and Zempoala Hidalgo state, units of milk production cycles and fat, are managed by men, with an average age of 50 years, leaving aside the direct or indirect participation of women. Overall the facilities, infrastructure and animal management are inadequate for the development of the activities of each production unit; based food forages and concentrates the region made by the producers themselves, without knowing the percentages of inclusion of each ingredient, are problems that occur in most production units. Producers do not keep records of any kind or any activity, which results in decreased production. 90% of respondents have not developed or participated in any activity of the Center for Agricultural Development of the State of Hidalgo (CEFOAH), which is reflected in the production in each production unit.

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