

Alice Rooke
Vincent Massey High School
Manitoba, Canada
Mexico, Factor 7: Animal Agriculture

Mexico: Improving cattle production in southern subsistent dual purpose farms

Introduction

June 22nd, 2016, 5:45pm; there were 7,431,324,371 people in the world. June 22nd, 2016, 6pm, there were 7,431,326,065 people in the world. Our population is steadily rising; our daily births more than double our daily deaths; and triple our yearly figures. There is no stopping the human race from growing, from evolving. Today the figure is approximately 7 billion, tomorrow the figure will be higher yet, next week still higher, next year... 20 years from now...30 years...; and by 2050, our population is predicted to reach over 9 billion people. Every single one of those nine billion people needs feeding.

How are we going to feed the world? The stem of our problem lies in the root of the plant.

World poverty affects millions of people all around the globe, and is especially rife in undeveloped or developing countries like Mexico. Mexico's current population sits at 128,602,728 people, ranking 10th highest in the world, on 1,943,082 square km of land. Almost 57% of this population live in poverty, and 28% in extreme poverty (Worldometer, 2016). The highest percentage of poor people typically reside in the rural communities of the country, this can be attributed to a number of factors. However, the outcome is always the same in that it is a cycle that once they are in they cannot get out.

In order to feed 9 billion people, we need to figure out how to feed 7 billion first, and this means looking at the base layers of the food chain and strengthening our links to feeding those that are hungry. We need to look back to the very basics of how produce is grown and how to help the small subsistence farmer by enhancing yields. This higher yield potential can generate income which can be used to develop his business, increase the nutritional diversity for his family and improve his quality of life. With increased income he can provide essentials such as health care and education for family members. Once these necessities are met, money remaining can be invested to grow and further develop his farm.

Rural Mexican Families

A rural subsistent Mexican farming family usually consists of three to six children, the mother, and grandparents all under the same roof (Compassion, Spring. 2015). These roofs are made of a base of bamboo and wood then later cement. Kitchens reside outside the building and consist of wood fires. The houses have no heating or air conditioning (Mindy & Jim Phypers, 2013). The husband of the family usually leaves to travel to America or central Mexican cities to try to diversify his income and earn a solid wage, part of which he sends back to his family. At home the mother and children are expected to take care of themselves, cooking, cleaning and growing what food they can as well as caring for the animals and crops they have. Several generations usually can be found together as the grandparents take care of the children and are often considered the heads of the household. Children attend school but many don't get further than elementary school. Moreover, the family has to travel to nearby towns for access to health facilities (Compassion, Spring 2015). Mexico does have social programs, for example 'oportunidades', which provide cash transfers to extremely poor rural families, provided they follow a set of rules. Examples of such are attaining an 85% school attendance, attending regular health check-ups or getting the free vaccines provided by the program (oportunidades study, April 20th, 2003). As a result of this education and health funding the literacy rate has climbed to around 90% and there is a positive incline to 2.1 doctors per 1000 people. (Statista. Worldbank, 2013). The average household income is

\$600 USD per annum. This must sustain the family throughout the year. Their diets usually have a low nutritional value and contain the main staple crops that they or their neighbours grow. These foods are corn and wheat tortillas, refried beans, rice, tomatoes and chilli peppers, and are the staple crops that subsistent farms usually grow alongside zebu and zebu cross European breed cattle, used for dual purpose of meat and milk. Rural families travel to a local market, or *mercado*, to outsource different foods as needed.

The barriers to improving the quality of life for a subsistent farming family lie in the low level of profitability and their inability to borrow money to be able to invest and develop their farms and business structures.

Farms in Mexico

When studying Mexican agriculture, we cannot classify all farmers as one. The large Mexican ranches are wealthy and consist of around a thousand head of cattle and 2500 hectares of land. These large ranches make up 2% of the private landowners and control 63% of land. They tend to reside in the northern or upper central states due to the arid and semi-arid climate which inhabits pastoral land. Another portion of the farmers are referred to as *campesinos*, subsistence low income farmers, whose farms consist of around five cows and two hectares of land. These farmers make up 40% of the private land owners. The last subdivision of farmers are the *ejidatarios*, or *ejido* farmers. *Ejidos* are communal plots of land that appeared after the Mexican revolution of 1915, to try and restore the land taken from the indigenous people (Agrarian Reform and *Ejido* Farms in Mexico, 1992). The government sectioned acres off into communities for them to work together to farm the land. Each section contained a percentage of cultivated land and pasture land. But because land could not be sold or bought, and because the government proceeded to favor the private farms and did not support the *ejidos*, these farms could not be developed and ultimately struggle to remain sustainable. Over the years, and even to this day, the *ejidatarios* have had to leave their home, family and farm to work in cities or the northern ranches, or even in America, to generate an income to cover family living expenses.

This devolution of the *ejido* and *campesino* farms due to the government's favouring of the larger farms leaves the subsistent Mexican farmers at a major disadvantage because they have to base their crop planting on when they can get home to tend to their land, resulting in their animals having to rely on the growth of native grasses. These small farms are typically located in the southern States of Mexico, 75% of which is humid tropical regions which experience wet winters and humid summers; deforestation occurred to establish the induced short native grass lands. The annual rainfall of southern Mexico is over 1000mm a year which can sustain sown grass lands and crops. Kikuyu grass can be planted to support milking cattle but it not a rich substance and is of poor quality feed value (Améndola, et al, 2005).

Animal Agriculture

The tropical cattle production systems of Mexico include dual purpose methods in which milk is produced as well as calves for weaning purposes. These systems are the simplest and most straightforward form of subsistence farming but the results are less than marginal. Fecundity in cows is not consistent with calving intervals around 565 days, and of these cows only 56% calve and 50% are weaned (McDowell, Ricardo Améndola, Epigmenio Castillo, Pedro A. Martinez, 2005). As a study conducted in 1996 states, "Dual-purpose systems around the world are biologically and economically inefficient and malnutrition is probably the major cause of low productivity and unsatisfactory reproductive performances." (McDowell, 1996) (Ricardo Améndola, Epigmenio Castillo, Pedro A. Martinez, 2005) These key factors impacting how inefficient a farm is leads to the end result of the *campesinos*' low income and essentially a compromised standard of living. Proper animal nutrition is imperative in producing cattle in any country or region and this is what is missing from the *campesino* dry periods. The southern humid tropics is a viable area to grow supplementary food sources to feed through dry periods to

improve livestock daily weight gain so farmers can produce thicker animals faster. The main reason that only 30% of small farms outsource supplements is due to the fact that this would amount to 14% of production costs. This small percentage that provides supplementary feeding through the dry season are feeding mostly molasses and locally grown resources such as citrus pulp and waste bananas. Only one percent of farmers are growing extra forages for their animals. Increased planting of corn maize has been recorded and a potential of 10% increase of overall production in dual purpose cattle systems is estimated if this practice is widely adopted (McDowell, Ricardo Améndola, Epigmenio Castillo, Pedro A. Martinez, 2005). This indicates that the area could develop its farming to more intensified levels given support and financial assistance.

Some *campesinos* that fatten their own cattle feed a mixed diet of 60% maize residues, 10% sugarcane tops, 30% wheat straw, and other industrial bi-products. However, their daily weight gain is only attaining 0.9 lb/day, meaning that time to slaughter can take as long as up to 24 months. Finished cattle are sold to middlemen as they have no direct marketing opportunities. Another study shows that weaning cattle with genotypes based on crosses of *bos indicus* and *bos taurus* cattle showed that native *bos indicus* breeds have a more efficient energetic feed conversion rate for beef production in this environment. The native breeds have adapted to succeed in these climatic conditions. (Jose Valentin Cardenas – Medina et al, 2010).

This status of animal agriculture stated above does not seem to be changing, but there are people starting to notice small flaws in the systems, such as the tightening regulations of shipping finished cattle to the United States. The trend towards finishing some cattle intensively on a cereal diet is increasing due to the change in the quality of carcass being demanded and the tightening of sanitary border restrictions on USA imports.

As stated in the Rural Mexican Families article the husband of the household usually has to leave and go to cities northern ranches, or America, to try and diversify his income. This farmer will try and base his crops around when he can tend to them. The women that are left to cook, clean and tend to their animals are working minimally to get by during their absence.

I believe by establishing a crop rotation, including an element of grain crop production, as well as providing a form of specific education for the women to enhance their understanding of the crops and animals they are tending to, the farmers could provide a better diet for cattle production. Deforestation could be reversed to some extent by improving the diversity of the area, leading to economic development and environmental sustainability, which will in turn benefit the small holder farmer and reduce poverty.

Other Major World Issues and How They Effect Mexican farmers

Mexico is a high risk country for extreme climate fluctuations caused by El Niño - tropical cyclones in the south east of Mexico, these can be detrimental to employment rates, as well as access to water and health care. Climate change may increase the frequency in storms resulting in more natural and human disasters. Huge storms can cause multiple problems through physical infrastructural damage and crop damage, consequently leading to economic strife. The cycle of rain fall in a year will determine the volume of crops that will be able to grow to feed the population. The amount of food grown will determine the malnutrition rates throughout the country and essentially determine the migration rates as well. It is predicted that higher migration rates could actually have a positive impact on Mexican family life as they migrate to better places or find more jobs available (United Nations, 2012). In the southern tropical rural communities there would be water in springs and reservoirs, however the water would be untreated and it would be the communities' responsibility to get the water to their homes and farms (Julia Taylor, 2008).

Mexico is the second largest energy consumer in Latin America and contributing to a large proportion of the world's energy consumption. In order to maintain and work towards a more economical future, the Mexican Ministry of Energy works internationally and as part of IRENA – International Renewable Energy Agency, to share renewable energy sources in the future; but is currently one of the world's largest crude oil and natural gas producers. For this reason, the rural community should not face any negative fuel problems in the future (IRENA, 2015).

My Recommendation

I believe that in order to improve a subsistent farming family's life, the *campesinos* need to be feeding their cattle dietary grain rations in order to produce cattle with higher fertility rates and better meat carcasses for themselves and their market. The increasing urban population in Mexico has changed dietary demand. There is now an increased call for more grain fed beef versus beef fed under grass grazing. If *campesinos* could use this demand to leverage improving the quality and quantity of what they are feeding their cattle, they could earn more money to sufficiently live as well as expand. But, at the moment, they cannot do this with the minimal support they have. They don't have the funding, education or resources to implement any kind of change that will help their livelihoods.

Rural development projects in the Mixtec Region and the Mazahau Zone have been financed in the amount of \$20.7 million USD, directly benefiting 20,000 households in the 2010-2020 projects (IFAD, 2016). This was initiated under the direction of the Millennium Development Goals (MDG) to tackle poverty and child mortality, as well as to increase school enrollment and access to cleaner water. This organization admitted groups of unorganized farmers on communal land plots to improve market links. In 2012 MDG was superseded by the Sustainable Development Goals (UN Rio + 20, 2012). This 2030 agenda has 17 goals to guide funding and policy for the next 15 years.

I have identified that four of these goals could be promoted in the areas I have researched in the south east Mexican *campesino* farms undertaking dual purpose cattle production. These are 1. No Poverty, 2. Equality Education, 3. Partnerships for Goals, and 4. Sustainable Communities (Millennium Project).

The *Oportunidades* is a proactive program that funds education for many young children and helps young families find adequate health care, but I also think education funding and programs need to progress to women in rural communities. Education of women in progressive livestock farming practices pushes forward the economic viability in the absence of men who may be pursuing off farm labour, and will empower the family unit and increase productivity and income.

Access to nutritional expertise for their livestock, analysis of feeds produced and formulation of complete diets for their cattle will increase the fertility of cows and daily live weight gain of weaned animals. Advice on new seeds for cropping mixed forage types for livestock, access to purchase these seeds and technological demonstrations of how to sow and harvest and preserve these feed stuffs will advance farming practices and profitability. Communities will naturally become more sustainable in the wake of this empowerment.

Conclusion

We cannot solve world poverty today. We will not solve world poverty tomorrow, or next year and probably not in the coming years after that. But we can work collaboratively to improve simple systems in everyday lives of rural subsistence families. In analyzing the basic structure of subsistent southern Mexican dual purpose cattle farms we can see that the basis of low profitability which leads to poverty is in the fundamental feeding rations of the cows from fertility rates to weaned livestock. Cows are not provided adequate nutrition in order to sustain their calf and produce milk for the family. Continuing on

to weaned calves that are kept for finishing, the lack of nutrition can push finishing periods up to 24 months due to low feed values and low weight gains. In order for this to change the farmers need to have funding, resources and specific education available to them so that they can progress and improve what they are feeding their animals; which will essentially boost their income to then reinvest into growing and developing their farm businesses.

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