Colegio de Postgraduados

Study of backyard poultry farming in the Sierra and Valley of Villaflores, Chiapas, Mexico

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ABSTRACT

Objective: to analyze the current status and factors that constraint backyard poultry farming in rural communities in the state of Chiapas, Mexico.

Design/Methodology/Approach: this study was conducted in four ejidos (a Mexican form of collective landholding) in the Sierra and Valle areas of the municipality of Villaflores in the Frailesca Region, Chiapas (Mexico) through a participatory diagnosis that considered a population of 1600 households. A correlational-causal cross-sectional design was used, along with systematic sampling determined by using the appropriate formula for finite populations.

Results: results showed that while 77% of households still breed birds, production has fallen 41% in the last five years. This activity persists especially in ejidos with greater marginalization, where interest in conserving aviculture is maintained. Despite the negative trend, backyard poultry farming continues to be an activity of interest in the ejidos considered to have a certain degree of marginalization, where a constant commitment to this practice is observed.

Limitations/Implications of the study: the distrust of the people surveyed in the face of the problems of social insecurity and paternalism that prevail in the study area, negatively influenced to obtain information that would have helped to comprehensively analyze backyard poultry farming.

Findings/Conclusions: despite the potential as an economic alternative to food insecurity, the decline in participation and production per household threatens the long-term sustainability of backyard poultry farming. Therefore, this study underscores the need to implement effective strategies to preserve this vital practice for rural communities.

Keywords: food security, poultry farming, rural production, social property.

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INTRODUCTION

Poultry farming plays a crucial role in feeding the Mexican population. According to SIAP (2025), per capita consumption is 24.4 kg of eggs and 37.3 kg of chicken meat; followed in descending order by pork, 21.8 kg and beef, 16.0 kg. In the first quarter of 2025, the growth of poultry meat (2.7%) and pork (1.5%) were relevant, as well as the supply of eggs, which grew 0.5%; in contrast, beef consumption contracted (SIAP, 2025). Regarding chicken meat and eggs, it is logical that there is an increasingly greater demand because their price is lower per kilogram. This also makes the growth in demand and in consumption greater, in addition to more availability in time and place.

However, an obstacle to the growth of poultry farming, especially backyard poultry farming, is the lack of technical assistance, the presence of diseases, lack of feed, predators, and the lack of organizational structures in the market (Mata *et al.*, 2023). In this regard, INEGI (2018) observed that, at the national scale, only a small fraction of poultry receives vaccines, deworming or technical assistance. Proof of this is that the inclusion of backyard poultry farming in government programs, such as the Mexico's strategic program for food security (called PESA, in Mexico), has had a limited impact and beneficiary families show a 20% continuity with the project after two years of implementation (Cruz *et al.*, 2016).

Despite these challenges, some studies suggest considering family poultry farming as a way to address food insecurity in rural communities through alternative models. These also preserve the environment and the knowledge transmitted from generation to generation (Becerra *et al.*, 2023). For these reasons, it was proposed to explore the current state and the factors that condition backyard poultry farming in the Sierra and Valley areas of the municipality of Villaflores, Chiapas (Mexico).

MATERIALS AND METHODS

Study location

The research implemented during 2024, in the ejidos Dr. Domingo Chanona (ChN), Mexican Agronomists (AM), Ricardo Flores Magón (RFM) and Los Ángeles (LA) in the Valle and Sierra region of the Frailesca region, Chiapas. These ejidos are located respectively 27 km, 42 km, 56 km and 66 km apart from the seat of the municipality, which is Villaflores, Chiapas. This region is in the Pacific coastal plain and the central lowlands of Chiapas. It is characterized by a high production of maize, also it is part of the physiographic regions Sierra Madre and central lowlands of Chiapas, with a terrain relief composed of sierras (hills or mountains) and valleys (INEGI, 2023).

Experimental design. The 'correlational-causal cross-sectional' experimental design described by Hernández & Mendoza (2018) was used. This design seeks to describe the relationships between two or more categories, concepts, or variables at a specific time, either in correlational terms or as a function of the cause-effect relationships among the variables.

Sample. For the selection of the sample, the systematic sampling described by Otzen & Manterola (2017) was used. Also, a population base of 1600 households was taken as the analysis framework, from which a calculated sample of 70 households was obtained. Sample size was determined using the appropriate formula for finite populations (Tillé, 2020);

$$n = \frac{N * Z_{\alpha}^{2} * p * q}{d^{2} * (N-1) + Z_{\alpha}^{2} * p * q}$$

where; N: total population; Z_{α}^{2}: 1.96 squared with 95% confidence; d: accuracy at 95%, $\alpha = 0.05$; $p*q$: binomial distribution; p: probability of success; q: probability of failure, each at 0.5%, which corresponds to (0.5) (0.5)=0.25.

A questionnaire was applied consisting of a set of questions suggested by Hernández & Mendoza (2018). This questionnaire included qualitative and quantitative variables related to poultry production, as well as management and development factors of poultry farming. The questionnaire also included variables for maize production, because this is the main resource used in poultry feed.

Variables evaluated. Different categories of households were evaluated in relation to poultry production; a) households that currently produce poultry; b) households that did so at some point; c) households that have never been involved in production; d) households that stopped producing poultry; and, e) households that are willing to resume activity. Information was collected on the average number of birds produced per household, the total number of birds per household, those causes that led to the abandonment of the activity, and the level of knowledge about poultry production and breeding.

Statistical analysis. A descriptive statistical analysis and a correlation analysis were performed with the IBM™ SPSS©- Statistical Package for Social Sciences (IBM, 2017).

RESULTS AND DISCUSSION

Poultry production, poultry consumption and maize production

Currently, 77% of households produce birds, 20% have had previous experience in this activity, but not today; and 3% have not tried poultry farming. In addition, it was observed that 52% of households that stopped producing birds are willing to resume the activity. Regarding the average number of birds per household, there has been a decrease of 41% compared to that number five years ago; this is, it has gone from 37 to 22 birds per household. One of the possible reasons is what Guevara *et al.* (2023) indicated, this is, that the abandonment of the backyard, as a productive and utilitarian space, is also linked to subsidiary policies that contravene the principles of sustainable access to food.

These results acquire greater relevance when considering the differences between the ejidos; especially, as a function of their proximity to the municipal seat (Table 1).

Except Los Angeles ejido, the other ejidos showed a certain positive relationship between the average number of birds per household and the distance to the municipal seat. That

Table 1. Status of poultry production by Ejido in the municipality of Villaflores, Chiapas, Mexico.

Ejidos	**Distance (km)**	**(%) of housewives that:**				**Average number of birds produced per household**	
		They are now producing	**They produced once before**	**They have never produced**	**They would produce again**	**5 years ago**	**Now**
ChN	27	47	40	13	40	33	20
LA	66	77	23	0	100	40	27
AM	42	83	17	0	67	42	17
RFM	56	100	0	0	0	34	23

ChN: Ejido Dr. Domingo Chanona; LA: Ejido Los Angeles; AM: Ejido Agrónomos Mexicanos; RFM: Ejido Ricardo Flores Magón † Distance to Villaflores (Chiapas), the seat of the municipality.

is, there are more birds per household the farther away the ejidos are from Villaflores, the municipal seat. This indicator could be influenced because higher population density leads to the atomization of plots. García *et al.* (2020) also observed that the reduction of the space of the plots increased the precariousness of poultry activity. In this study, among the variables that were important for poultry farming, more than the distance from the ejido to the municipal seat, the most important reason was the population density of the communities.

Poultry meat production and consumption. It was found that 4 out of every 6 kg consumed per month come from commercial strains, while the other 2 kg come from backyard birds. Of those who choose to consume commercial strains, 41.5% do so because they consider them cheaper. On the other hand, 43% of those who prefer to consume backyard poultry do so because they consider those healthier and with better flavor, because producers feed them maize. However, the preference for commercial birds may also be due to some health concerns in backyard poultry farming. In some places this is critical because of the poverty and marginalization that prevail in certain regions of Chiapas and in other states of the country (Medina *et al.*, 2018; Ramírez *et al.*, 2024).

Faced with these challenges, backyard poultry farming emerges as a strategy that allows rural families to generate alternative means of self-consumption and economic income from women's work to promote family well-being (Jaramillo *et al.*, 2018; Romero, 2021). If this strategy is not strengthened, backyard poultry meat consumption could decrease further; as shown by the downward trend in backyard poultry production over the past five years and the increase in preference for commercial poultry due to their lower cost.

Although the percentage of preference for creole birds was declared as higher, with the argument of a better taste and a favorable health response, this did not translate into a higher consumption, rather was it the expression of a communicated preference. In this sense, it is notable that the most populated ejido (ChN), the closest to the municipal seat, had fewer households with poultry production, only 30% of these, and 24% less maize production than the average produced in the four ejidos. This result could be due to the smaller plots. In contrast, in the ejido RFM, the least populated and also far from the municipal seat, all households reported that they have poultry and maize production. Although both ejidos show a similar number of birds per household, 81% of the producers are dedicated to the breeding of native birds, valued for their better flavor, greater health and resistance to diseases.

Maize production. Forty-six percent of households do not plant maize, but 77% of households do produce poultry, suggesting that some housewives continue to breed poultry even when the husband has stopped planting the grain. This is despite the fact that in the last five years, although maize yield has been maintained between 5 and 5.8 tons per hectare, the area planted per producer has decreased from 6 to 3 ha. This trend was influenced by the disinterest of older producers in providing accurate information during interviews. Especially if you consider that 45% of producers are between 35 and 65 years old and show a higher level of distrust.

Relationship between the average number of birds per household and the distance to the municipal seat

Only in three of the four ejidos studied (ChN, AM and RFM) was a moderately significant positive correlation (0.676) found between the number of birds per household and the distance to the municipal seat. It also turned out that the farthest ejido (LA) had the lowest ratio between the number of birds per household and the distance from the municipal seat (Table 1), possibly due to a higher percentage of extra-agricultural workers (15.4%), which implies a lower dependence on productive activities within the ejido. Although health issues account for 40% of the 11 reasons identified for bird population decline, it is not considered a major cause of aviculture abandonment.

Knowledge and decrease in poultry farming

The reasons for abandoning the activity can be visualized in a grouped mode (Figure 1). It is highlighted that the lack of space and economic resources are the most significant causes, respectively in 40% and 50% of cases. Regarding the reasons for abandonment, Kumar *et al.* (2021) noted that the main limitation of backyard poultry farming was the high mortality rate due to a combination of diseases. If such a reason were in accordance with this study, it would be partly due to lack of knowledge (Correia-Gomes & Sparks, 2020).

Although 72.4% of housewives indicated that the number of laying months per year is four to six, which is considered technically acceptable, the rest of the indicators varied between 56.7% and 66.6%. This means that 33.4 to 43.3% of responses were outside the range considered acceptable (Figure 2).

Health. The main diseases affecting birds are respiratory diseases (27%), white diarrhea (26%), fowl pox (25%) and Newcastle (22%). However, 77% of housewives who are dedicated to poultry production reported that they vaccinate their birds. Thus, the diseases may be due to poor sanitary management by housewives (Toapanta *et al.*, 2019; Kumar *et al.*, 2021). In addition, variability was observed in vaccination dates, July is the predominant month (42%), followed by January (28%), December (14%), and March (11%). Also, 14% of the people surveyed responded that they vaccinate the birds every six months, usually in January and July.

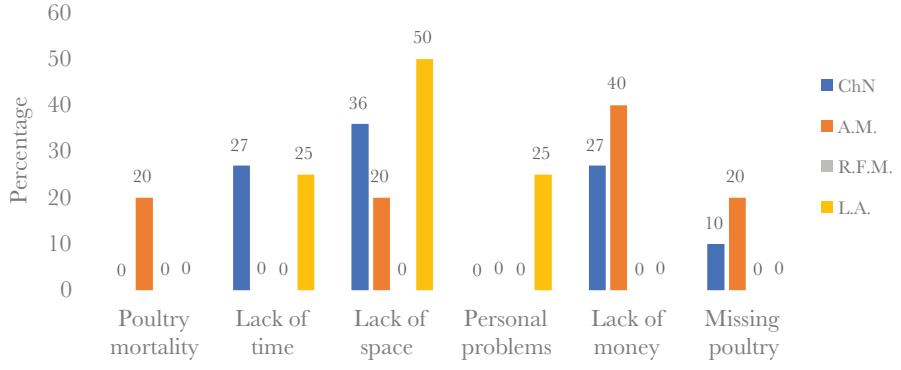

Figure 1. Reasons for abandonment (%) of backyard poultry farming in ejidos in the state of Chiapas, Mexico.

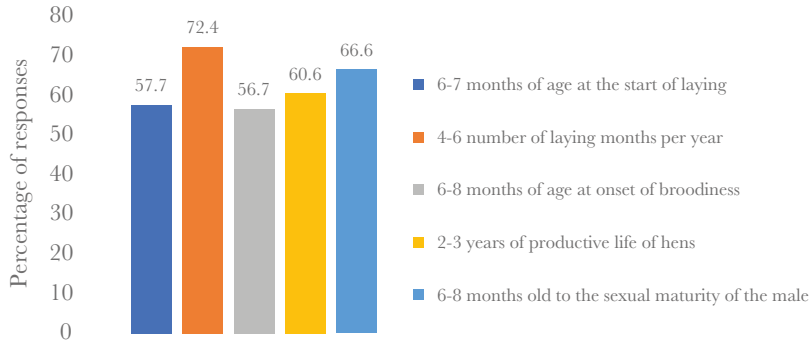

Figure 2. Knowledge of the technical indicators (%) of backyard poultry farming in ejidos of Chiapas, Mexico.

Parasitosis is another health problem, especially due to consuming contaminated water from domestic service, or by ingesting food from the ground or waste containers, an aspect that is not considered a problem by housewives. These health challenges may be one of the reasons why 81% of housewives choose to breed creole landraces, as they are not only valuable to ethnic communities, but also serve as an important genetic reservoir for breed development globally (Becerril *et al.*, 2024). Although the genetic diversity and conservation of the genes of native hens are threatened by the distribution of exotic hens (Senbeta & Keyata, 2024).

In this context, the existence and physical and hygienic conditions of the facilities and equipment are of paramount importance. All the housewives who raise birds claimed to have a shed for chicken with a roof and close to their homes. Of the total, 46% women have had sheds for approximately 12 years on average, while the others allow birds to be free during the day and confine them at dusk. This is similar to what was reported by Thomas *et al.* (2025) about there is a preference and willingness to breed birds outdoors, even with a shed available, although nighttime housing practices are variable.

A 70% of housewives mentioned that the reason why they choose to have their hens locked up is because of the risk of loss due to theft or attacks by predatory animals. As for the feeders and drinkers that are used, most are improvised with waste containers, only 5% are of industrial origin for that purpose. These are placed outdoors or in the shade of trees, and only 7% are located in the household backyard, under a roof top.

Extra-agricultural activities. A 35% of the families that are dedicated to the production of maize, get additional income with extra-agricultural activities. Of those, 61% are dedicated to the provision of services and commerce, 16% work as professionals, 15% are involved in livestock and coffee production, and only 8% work as laborers or factory workers. This shows that extra-agricultural work is a strategy used by the population to supplement their income, and in some cases, it constitutes the only available economic source. These activities are done both inside and outside the ejido, the municipality and even out of the state of Chiapas. This supports what was reported by Morett & Cosío (2017), who found that only 34.3% of young people, in at least 58.8% of the ejidos in Mexico, remain in their lands and join some productive activity.

Of the extra-agricultural workers, 67% work within the community, 17% outside the community but within the municipality, and 16% outside the municipality but within the state. Regarding the number of months dedicated to those activities, 75% do those during the 12 months of the year, while the remaining 25% work for 10 to 11 months, with average daily income ranging from $100 to $500 Mexican pesos (MXN) in 73% of cases. In addition, 41.2% migrate outside the country, 10.7% to urban areas (big cities); and only 2.6% are employed in rural activities, possibly agriculture-related, since a non-agricultural work wage is a better alternative for many young people (Gutiérrez *et al*., 2019).

In the case of families that have stopped producing maize, 27% pointed to lack of land, or scarcity of economic resources (27%) and low profitability (18%) as the main reason. These families have opted for various trades, such as blacksmithing, masonry or carpentry (56%), day laborers or factory workers (22%) and commercial activities or poultry farming (22%). The average number of years dedicated to these new activities is 9 years, with a working duration of 12 months a year in 89% of cases, and only 11% work 6 months a year. The average daily income is $183 MXN, with a mode of $200 MXN. The 77% of these activities is done within the community, and 23% outside, but within the municipality.

In the specific case of the Los Angeles ejido, despite its farthest location from the municipal seat, it has 1.9% more extra-agricultural workers, this is 15.4% in total, compared to the nearest ejido (ChN), which has 13.3%; this situation can be attributed to the migration that characterizes the LA ejido. It is likely that the migration of the inhabitants of the ejidos most distant from the municipal seat is mainly directed to places outside the municipality. This is due to the low dynamism of agricultural activities and the scarce supply of labor alternatives for the young population. This is consistent with the findings of Morett & Cosío (2017), who indicated that four out of ten young people leave their community in search of employment; and they are mainly directed towards the U.S.

CONCLUSIONS

Despite the challenges of backyard poultry farming, such as health issues, space shortages, and other factors, poultry farming remains a source of income and food for people living in rural communities. In the willingness of households to continue or resume the activity, together with the high value attributed to native bird landraces in the local market, their economic and cultural relevance is highlighted.

Coordinated intervention between government and communities is essential to strengthening backyard poultry farming, addressing key issues such as animal health, access to financial resources, and technical capacity building. These actions can contribute to the improvement of productivity and sustainability of the poultry production sector in the state of Chiapas.

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