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RESEARCH ARTICLE

CHARACTERISATION OF POULTRY FARMING IN TWO SUBURBAN AREAS OF ABIDJAN (IVORY COAST) AND THE USE OF PLANT EXTRACTS IN THESE FARMS

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Abstract

The aim of this study was to characterise poultry farming systems in Bingerville and Yopougon, two peri-urban areas of Abidjan, and to analyse the use of plant extracts in poultry health management. To this end, a cross-sectional survey was conducted among 58 farmers using well-structured questionnaires. The data collected were analysed using descriptive statistics with SPSS Statistics 25 software, whilst Excel 2016 was used to produce the graphs.The farms surveyed were mainly located in Yopougon (69%) and run by men (96.6%), with an average age of 38.54 ± 0.16 years and predominantly of Ivorian nationality (72.4%). Among these farmers, 34.48% were illiterate and livestock farming was the main occupation of 82.76% of those surveyed, although only 15.52% had received formal training in livestock farming. Livestock systems were dominated by semi-modern methods (60.34%), with herds ranging from 8 to 6,000 head. The species reared mainly comprised hybrid chickens (32.8%), laying hens (24.1%), quails and African chickens (20.7% each). Furthermore, digestive, respiratory and skin diseases were frequently observed (84.48%). Whilst the majority of poultry farmers used modern treatments (72.41%), 22.41% used plant leaves, administered orally to their poultry. Thus, the plant species identified (Moringa oleifera, Basilicumcanum, Urticadioica, Tal inumpaniculatum, Phyllanthusamarus and Spinaciaoleracea) demonstra ted preventive efficacy against various avian diseases.

Furthermore, the absence of a significant correlation ($p > 0.05$) between the use of plant extracts and socio-professional variables confirms that the use of plants in poultry farming is part of a widely shared cultural, economic and practical approach, rather than one dependent on the socio-economic characteristics of the producers. Hence, the judicious and scientifically guided incorporation of plant extracts could offer an alternative for improving productivity, health and sustainability in poultry farming.

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Introduction:-

In sub-Saharan Africa, poultry farming is a vital component of livestock production. This sector helps to generate or increase the livelihoods of peri-urban and rural populations (Vidogbena et al., 2010). In Côte d'Ivoire, poultry farming plays a significant role in the national agricultural economy, particularly in the peri-urban areas of Abidjan, where it contributes to the livelihoods of local populations facing constant population growth (FIRCA, 2024; IPRAVI, 2025). Furthermore, the development of this livestock farming in the area is part of a wider trend towards diversifying farmers' sources of income, whilst also meeting the high demand for animal protein (FAO, 2020). Various livestock farming systems coexist in the peri-urban area of Abidjan and very often face significant economic losses, generally due to avian diseases that slow down production (Brouet al., 2020). Consequently, to combat these diseases, farmers frequently use antibiotics, which pose public health risks due to the emergence of antimicrobial resistance resulting from the overuse of these antibiotics (Manyi-Lohet al., 2018). In this context, the use of medicinal plant extracts is one of the most common approaches to improving animal health and productivity (Alloui, 2013 ;Pashaeiet al., 2024). Indeed, various studies have highlighted the anti-inflammatory, antimicrobial and immunostimulant properties of certain local plant extracts that can benefit poultry (Pashaeiet al., 2024). The incorporation of various plant extracts into treatments or feed by farmers is a well-known practice among farmers in the peri-urban areas of Abidjan (Jambwa, 2022). However, a detailed characterisation of these farms, together with an analysis of phytotherapeutic practices, would be necessary to understand the challenges faced by these farmers. This study is part of that effort, aiming to characterise poultry farms in two peri-urban areas of Abidjan, namely Bingerville and Yopougon. It then seeks to analyse the use of plant extracts in these farming systems.

Materials et Methods:-

Study site:-

The studywasconducted in peri-urban areas of Abidjan, specifically in the municipalities of Bingerville and Yopougon (Ivory Coast) in 2025.

Type and period of study:-

This was a prospective, descriptive and analytical study conducted over a period of three (3) months. The study involved the systematic collection of primary data from poultry farmers, followed by a descriptive statistical analysis of the information gathered.

Study population:-

The target population consisted of farmers actually engaged in poultry farming in the study area. Producers engaged in poultry farming (traditional, semi-intensive or intensive systems) and who had at least one production cycle completed or in progress at the time of the survey were included. Individuals not engaged in poultry farming or who did not have an active flock during the data collection period were excluded.

Sampling strategy and sample size:-

A purposive sampling method designed to be representative was adopted, taking into account the diversity of farming systems (traditional, semi-intensive and intensive) and the geographical distribution of the farms.

The sample size (n = 58) was determined on the basis of:

- the prospective and descriptive nature of the study;
- the logistical and time constraints associated with the duration of data collection;
- the level of precision required for a local descriptive study;
- the duration of the survey

It should be noted that, as the number of poultry farmers in the study area is unknown, it was not taken into account when determining the sample size.

In addition to the inclusion criteria (actively practising poultry farming at the time of the survey) and exclusion criteria (people not practising poultry farming), the following criteria were applied:

- a minimum length of service corresponding to at least one production cycle;
- the ownership or effective management of a flock at the time of the survey;
- accessibility of the farm;
- availability and informed consent of the participant;

This approach resulted in a diverse sample that is representative of local poultry farming conditions.

Data collection tool:-
The data were collected using a structured questionnaire (survey form) administered during face-to-face interviews. The data collection tool mainly comprised double-choice and multiple-choice questions, supplemented by a few open-ended questions to gather additional qualitative information.

The questionnaire was organised into four sections, namely:
1. Sociodemographic characteristics: age, gender, educational level, professional experience, main source of income.
2.Characteristics of the poultry farm: type of farming, flock size, infrastructure, feeding system, health and preventive practices.
3.Knowledge and practices related to poultry farming: disease management, use of veterinary medicines, biosecurity measures.
4.Use of plant extracts: use of medicinal plants in the management of avian diseases.
Before the survey began, the questionnaire was pre-tested with a small number of farmers to assess the clarity of the questions, internal consistency and the time taken to complete it. The necessary adjustments were made before the final data collection.

Statistical analyses:-
The data collected were coded, entered into SPSS Statistics 25 software, and then analysed using descriptive statistics to determine the frequency, mean, maximum and minimum values, in order to describe the characteristics of the farms and poultry farming practices observed in this study area. In addition, Pearson's chi-square test was used to investigate a correlation between the educational level of poultry farmers, their training in poultry farming and the use of plant extracts in farming. Similarly, correlations between the type of poultry reared, flock size and the use of plant extracts were investigated.

Results and Discussion:-

Results:-

Sociodemographic characteristics:-

Study site:-
This study covered two sites. The study population was divided into 31%, or 18 farms, for the Bingerville site and 69%, or 40 farms, for the Yopougon site.

Gender of the surveyed population:-
Analysis of the data showed that the sample comprised 56 male farmers and 2 female farmers, representing 96.6% and 3.4% of the study population respectively (Figure 1).

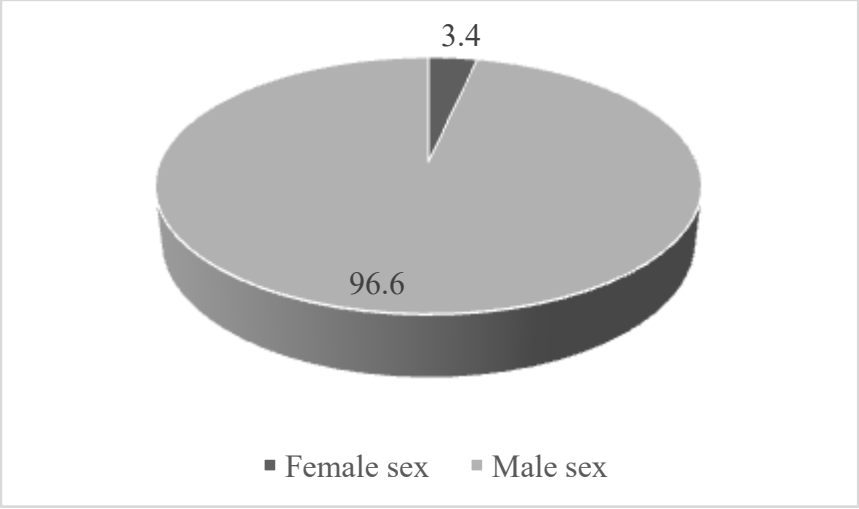

Figure 1 :Breakdown of the study population by gender

Age of the study population :-
The age of the study population ranged from 24 to 49 years, with a mean of 38.54 ± 0.161 years.

Nationality of the study population:-
Several nationalities were identified in this survey (Figure 2). However, the Ivorian nationality was the most prevalent, accounting for 72.4% of the sample, or 42 farmers. The Malinké nationality was the least represented, accounting for 1.7% of the study population, or just one farmer.

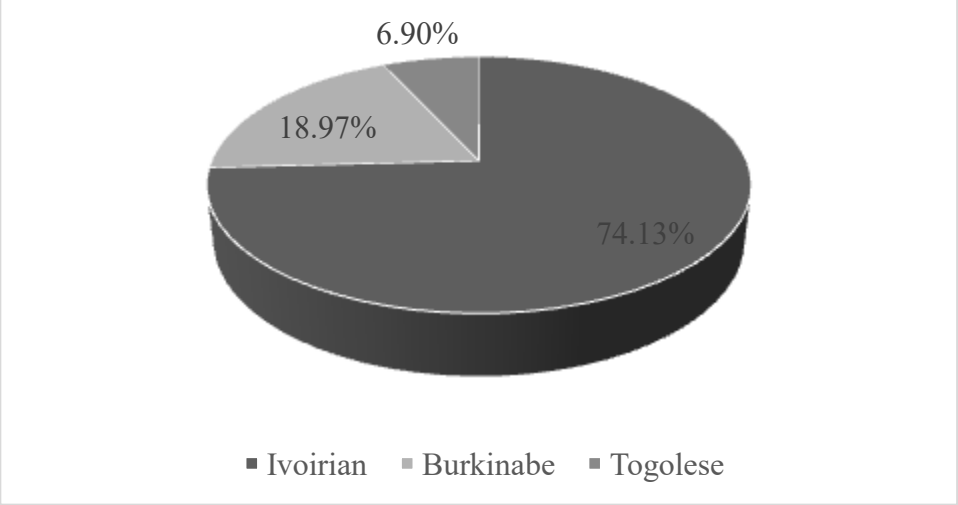

Figure 2 :Breakdown of the study population by nationality

Marital status of the study population :-
Figure 3 shows the breakdown of the surveyed population by marital status. The results showed that 70.69% of the population were married (41 farmers), compared with 29.31% who were single (17 farmers).

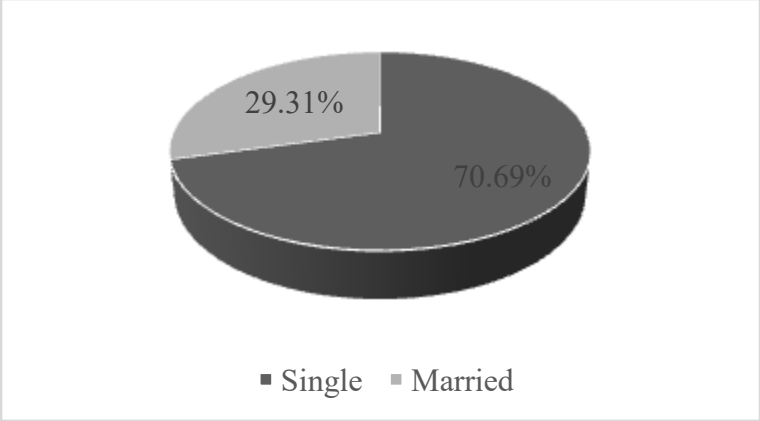

Figure 3 : Breakdown of the population by marital status

Main activity:-
The majority of the population surveyed cited livestock farming as their main occupation, accounting for 82.76% (48 people). The other respondents practised livestock farming as a secondary activity; these included one (1) farmer (1.72%), two (2) nurses (3.45%), two (2) mechanics (3.45%), one (1) carpenter (1.72%), two (2) livestock technicians (3.45%) and two students (3.45%).

Level of education:-
37.93% of respondents had completed secondary education, amounting to 22 people. Among the respondents, 6 had completed primary education (10.35%), 10 had completed higher education (17.24%) and 20 were illiterate (34.48%).

Livestock farming qualifications:-
Analysis of the results showed that 15.52% of respondents—9 poultry farmers—had received training in livestock farming, compared with 84.48%—49 poultry farmers—who had not.

Characterisation of poultry farms:-
Types of poultry reared:-
Figure 4 shows the distribution of farms by type of poultry reared. The results showed that 20.7% (12 farms), 24.1% (14 farms), 32.8% (19 farms) and 20.7% (12 farms) of the farms were quail, laying hen, hybrid chicken and African chicken farms respectively. Furthermore, turkey farming accounted for 1.7%, representing just one (1) farm.

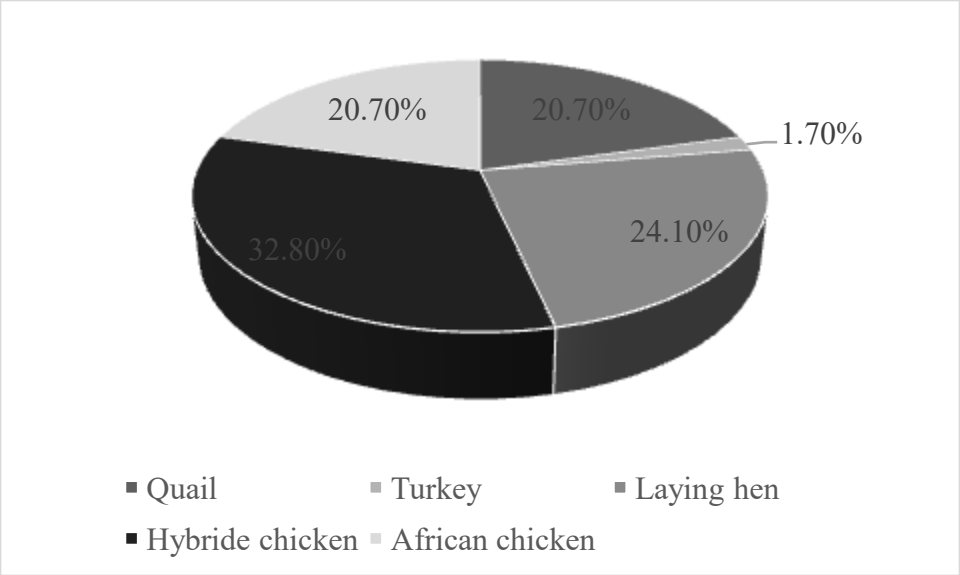

Figure 4: Breakdown of the types of poultry reared by the study population

Farming environment:-
All farms (i.e. 100%) were located in rural areas.

Farm status:-
Various farm statuses were recorded during the survey. Thus, 43.1% (i.e. 25) of the farms were family farms, 51.72% (i.e. 30) were individual farms and 5.18% (i.e. 3) were academic farms.

Livestock farming systems:-
The livestock farming systems used in this study comprised 60.34% (35 farms) of semi-modern systems, 27.59% (16 farms) of traditional systems, and 12.07% (7 farms) of modern systems (Figure 5).

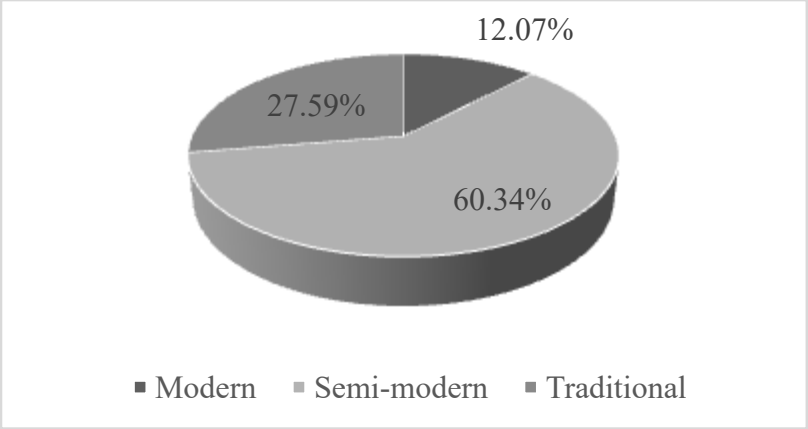

Figure 5 : Breakdown of the study population by farming system

Livestock:-
The livestock numbers on the farms included in the survey ranged from 8 to 6,000 birds, with an average of 1,243.29 ± 218.113 birds.

Poultry water supply:-
The majority of farmers (34 farmers) provided their poultry with well water (58.62%), 6.9% (4 farmers) used borehole water and 34.48% (20 farmers) used tap water. With regard to the feed given to poultry, 89.66% (52 farmers) of the farmers surveyed fed their animals commercial feed, compared with 10.34% (6 farmers) who mixed their own feed. Among the commercial feeds used, feed from the company FACI was used by 3.85% (2 farmers) for chick rearing, growth and laying. As for feed from IVOGRAIN, it was used by 42.31% (22 farmers) for chick rearing, 61.53% (32 farmers) for growth and 73.08% (38 farmers) for laying. As for feed from KOUDIJS, it was used by 53.84% (28 farmers) for chick rearing, 34.62% (18 farmers) for growth and 23.07% (12 farmers) for laying.

Common diseases:-
Of the poultry farmers surveyed, 49 (84.48%) reported frequently encountering diseases, compared with 9 (15.52%) who did not frequently encounter them. Of the 49 poultry farmers, 83.67% (41 farmers) commonly observed digestive diseases, 14.29% (7 farmers) commonly recorded respiratory diseases and 2.04% (1 farmer) commonly recorded skin diseases.

Prevention:-
Only 22.42% (13 farmers) of farmers used traditional treatments, compared with 72.41% (42 farmers) who used modern treatments and 5.17% (3 farmers) who did not use any treatments. Stall cleaning was practised by 62.10% (36 farmers) of farmers, compared with 37.9% (22 farmers) who did not practise it.

Use of plant extracts:-
Analysis of the results showed that only 13 farmers (22.41%) used plant extracts on their farms, compared with 45 farmers (77.59%) who did not use plants on their farms. Among those who used plants, 61.54% (8 farmers) used plant extracts for therapeutic purposes, compared with 38.46% (5 farmers) who used them in their poultry feed. Whether for therapeutic or feed purposes, all plant extracts were administered orally and only the leaves were used by the farmers.

Names of plants used:-
Various plants were used by livestock farmers; the most frequently mentioned was Moringa oleifera (11 times). Urticadioica was mentioned three times, Basilicumcanum twice, and Talinumpaniculatum, Spinaciaoleracea and Phyllanthusamarus were each mentioned once.

How to use plant extracts:-
Whether for disease prevention or as feed, the poultry farmers who used plant extracts in their flocks (13 farmers) gave their birds fresh leaves (after washing them with water) to peck at.

Effects of plant extracts on diseases:-
All eight farmers using plant extracts to prevent digestive, respiratory or skin diseases reported being satisfied, as none of these conditions were observed in poultry that regularly consumed the plant leaves.

Correlation:-
The results of the correlation analysis between the parameters are shown in Table 1. Analysis of the results showed that the correlations between farmers' use of plant extracts and their level of education, their qualifications in livestock farming, the type of poultry reared and the size of the flock were not significant ($p > 0.05$).

Table 1: Correlation of selected parameters

Correlations	Pearson's chi-square		
	Value	ddl	Asymptoticsignificance (two-sided)
Level of study * Use of plant extracts	1,794	3	0,616
Livestockfarming training * Use of plant extracts	2,973	1	0,085
Type of poultry * Use of plant extracts	6,145	4	0,189
Herd size * Use of plant extracts	2,657	2	0,193

*** p> 0.05: not statistically significant**

Discussion:-

The survey results revealed a higher number of poultry farms surveyed in the municipality of Yopougon compared to that of Bingerville. This spatial distribution appears to result partly from the methodological focus on layer farms. Indeed, Bingerville has a recognised history of broiler chicken farming. Furthermore, the rapid urbanisation observed in this area has contributed to a reduction in land dedicated to pastoral activities, leading to a steady decline in the number of farms in this area (FAO, 2019 ;Kouameet al., 2018). This trend, already observed in several African peri-urban areas, confirms the decisive role of urbanisation in the reconfiguration of livestock production systems (FAO, 2020). The predominance of men among the poultry farmers surveyed reflects a greater involvement of men in poultry farming in the rural areas of Bingerville and Yopougon. This situation could be explained by a socio-cultural division of roles, whereby women are more involved in trade and market gardening than in livestock farming itself. Indeed, livestock farming is traditionally perceived as an activity falling under the responsibility of heads of households (MINADER, 2017). These findings are consistent with those reported by Brouet al. (2020) in the rural area of Dimbokro, where low female participation in poultry farming was observed. In contrast, Silue's (2017) observations in Kabadougou revealed that women are predominantly involved in traditional poultry farming. This discrepancy highlights the influence of the local socio-cultural context and the type of farming system on the gender-based division of roles.

Regarding the age of respondents, the average was estimated at 38.54 ± 0.161 years, indicating that poultry farming is mainly practised by young people, reflecting the general demographic structure of the Ivorian population (INS, 2021). Furthermore, the predominance of Ivorian nationality among the respondents is naturally explained by the fact that the study was conducted in Ivorian Coast. Furthermore, the majority of poultry farmers were married, a marital status that entails family responsibilities likely to encourage them to seek income-generating activities or to diversify their sources of income. Poultry farming thus appears to be an economic strategy aimed at ensuring the household's financial stability, either as a complement to or a substitute for other activities (Ouattaraet al., 2019).
Livestock farming was the main activity for the majority of respondents. As these farmers are located on the outskirts of Abidjan, the economic capital of Ivorian Coast, they benefit from a large consumer market, making poultry farming economically attractive (FAO, 2020). Furthermore, as poultry farming does not take up the whole day, it allows farmers to engage in other income-generating activities. However, only 15.52% of poultry farmers had received formal training in poultry farming. This low proportion suggests that poultry farming is perceived as a simple and accessible activity, even though its success depends on specific technical knowledge of nutrition, hygiene and health management. However, several studies have shown that a lack of training is a major limiting factor in the productivity and profitability of poultry farms, particularly in terms of feeding, biosecurity and health management (Sonaiya and Swan, 2018). Despite this, the relatively high level of education observed among

respondents can be interpreted as the result of Ivorian public policies implemented to promote universal schooling for the sustainable improvement of human capital (MENETFP, 2020).

All the farms surveyed were located in rural areas, mainly in small villages offering a relatively quiet environment. This location is conducive to the welfare of the poultry, as stress reduction is recognised as a key factor in improving zootechnical performance (Bessinet al., 2016). As for the poultry species encountered, these included quail, laying hens, African chickens, turkeys and, predominantly, hybrid chickens. The choice of the latter is explained by their rapid growth, higher weight and organoleptic qualities similar to those of local chickens, which are highly appreciated by Ivorian consumers. Furthermore, the higher economic value they command on the market provides a major incentive for livestock farmers (Kouadioet al., 2019). The predominant farming system was semi-modern, with farms predominantly run on an individual or family basis and a limited number of academic research farms. The average herd size of 1,243.29 ± 218.11 head is characteristic of this type of system, which lies between traditional and intensive farming (FAO, 2019). With regard to watering, the widespread use of well water is due to the limited access to drinking water in rural areas and its cost, unlike well water, which remains free. However, this practice can pose a health risk as the microbiological quality of the water is not monitored (WHO, 2017). As for feed, it was mainly commercial feed used during the start-up, growth and laying phases. Although more expensive, these feeds are preferred due to their superior zootechnical performance compared to home-made feeds, which are often nutritionally unbalanced (Ravindran, 2013).

The conditions observed were mainly digestive, respiratory and skin-related, with digestive disorders being the most prevalent. These findings are similar to those reported by Brouet al. (2020) and may be linked to shortcomings in hygiene, water quality and feed management. Despite these health risks, 5.17% of farmers reported that they did not provide any treatment for their poultry, thereby exposing their farms to significant economic losses. The remaining farmers relied on modern veterinary medicine or traditional treatments. The study revealed that eight poultry farmers were using plant extracts, administered orally for prophylactic purposes. This practice forms part of an approach aimed at reducing the use of antibiotics and preventing antimicrobial resistance, a major global public health issue (WHO, 2017). Thus, the leaves of Moringa oleifera, Urticadioica, Ocimumcanum, Talinumpaniculatum, Spinaciaoleracea or Phyllanthusamarus were given directly to the poultry after washing. These plants are recognised for their nutritional, antimicrobial, antiparasitic and immunostimulant properties, contributing to improved health and zootechnical performance in poultry (Gueye and Diouf, 2016; Abdullahiet al., 2019).

The absence of a significant correlation ($p > 0.05$) between the use of plant extracts and socio-professional variables (level of education, experience, type of poultry reared and flock size) suggests that the use of plants in poultry farming is a practice independent of the individual characteristics of the farmers. The lack of a link with educational level could be explained by the fact that ethnoveterinary practices are based primarily on traditional knowledge passed down orally. This knowledge is accessible to all farmers, regardless of their educational level in sub-Saharan Africa. According to studies by Ndahambelelaet al. (2021), small-scale producers make extensive use of medicinal plants due to their accessibility and the limited availability of modern veterinary services.This horizontal dissemination of knowledge helps to standardise practices within rural communities. Similarly, the lack of correlation between the use of plant extracts and training in animal husbandry suggests that this practice is not linked to training. Indeed, ethnoveterinary practices are widely shared within rural communities and adopted independently of individual experience (Wiseman et al., 2023). Furthermore, the lack of a relationship with the type of poultry reared and the size of the flock shows that the use of plants is a cross-cutting practice. Indeed, several recent studies indicate that medicinal plants are used in both extensive and semi-intensive systems, particularly to combat parasitic infections and other avian diseases. Dikelediet al. (2025) have shown that plants such as Vernoniaamygdalina and Carica papaya are widely used by African poultry farmers, regardless of their production system. These practices are driven by their low cost, local availability and integration into traditional systems.

In Ivory Coast, research also confirms the importance of plant extracts in improving the zootechnical and health performance of poultry. Bonny et al. (2025) demonstrated that the use of plant extracts can have a positive influence on the microbiological and physiological parameters of broiler chickens, thereby highlighting the growing interest in these natural alternatives within modern Ivorian poultry farming. Finally, the lack of statistical significance could also be linked to methodological factors, notably the sample size or the low variability of the variables studied. It may also reflect the homogeneity of rearing conditions and health constraints in the study area, leading to similar practices among poultry farmers. In summary, these results highlight the need to better integrate these practices into animal health strategies and to continue research into their scientific efficacy.

Conclusion:-

This study provided a profile of poultry farms located in the municipalities of Youpougon and Bingerville, on the outskirts of Abidjan, Ivory Coast. It revealed that poultry farmers in this area—who are predominantly young, male, married and educated—do not receive specific technical training in poultry farming. The farming systems were semi-modern, with an average flock size of around a thousand birds, comprising quails, laying hens, hybrid chickens, African chickens and turkeys. Poultry feed consisted mainly of commercial feed, reflecting a focus on commercial production, whilst the use of well water for drinking raises potential biosecurity concerns. Beyond this structural and technical characterisation, this survey highlighted the coexistence of two health management approaches, namely: the use of modern veterinary medicines and the use of plants from the African pharmacopoeia. These findings make a significant contribution to our understanding of health dynamics in peri-urban poultry farming and highlight the potential of phytotherapeutic strategies as alternatives or complements to conventional treatments.

Against a backdrop of growing concerns over antibiotic resistance, the judicious integration of plant-based solutions could represent a promising avenue for improving the health and economic sustainability of farms. However, this study has limitations in that it relies primarily on the opinions of poultry farmers and there is no laboratory evidence to corroborate the efficacy of the plant extracts used. Thus, the integration of plant extracts into poultry health management requires rigorous scientific validation of the plant species used, particularly in terms of safety, dosage, efficacy and method of administration. It also appears essential to strengthen technical training for farmers and veterinary supervision in order to ensure the rational and safe use of conventional or phytotherapeutic treatments. Ultimately, this study opens up avenues for research into the experimental evaluation of extracts from identified medicinal plants and the development of integrated protocols combining modern veterinary medicine with local phytotherapies. Such an approach could contribute to the health and safety of livestock farms, the reduction of production costs and the sustainable promotion of traditional knowledge in the development of peri-urban poultry farming.

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