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Research Article
Current Status of Family Poultry Production in Togo

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Abstract
Background and Objective: Appropriate poultry development strategies based on sound knowledge of family poultry practices can benefit households substantially by contributing to food security, women's empowerment and poverty reduction in developing countries. This study was conducted to obtain information on family poultry practices in Togo. **Materials and Methods:** This baseline study on family poultry production was carried out in the five regions of Togo. Semi-structured questionnaires were used by trained investigators to collect data through individual interviews in 1,468 households. **Results:** The results showed that the majority of men in Togo (65.48%) owned poultry and that agriculture is the predominant occupational activity of most (91.35%) poultry farmers. The leading purposes for keeping poultry species were for personal food consumption and income (39.37%). Birds were most often (87.10%) purchased to form the initial poultry flock. Body size was reported by 21.67% of respondents as the trait that most influenced the choice of purchase, followed by a combination of body size and plumage (23.16%). The poultry owned were mainly chickens (n = 50±7), followed by pigeons (n = 31±7) and Guinea fowl (n = 23±5). Cereals were the major feed constituents, particularly maize (95.09%), followed by millet (43.71%), leftovers (35.32%) and sorghum (34.49%). The main sources of water supply for poultry maintenance were wells (36.07%) and boreholes (32.97%). Disease (66.16%), theft (20.17%) and predation (11.54%) were the leading causes of poultry loss. The most common of these diseases were Newcastle disease, coccidiosis, smallpox, bronchitis, salmonellosis, vitamin deficiency and intestinal worms. Approximately 33.15% of respondents reported having provided veterinary care, whereas herbal treatments were used by 46.62% of respondents to prevent or treat diseases in poultry flocks. More than half (55.24%) of the respondents had access to extension services support and 81.38% reported being satisfied with the support provided. **Conclusion:** Poultry diseases, lack of information and training on management practices are the important constraints in the current status of family poultry production in Togo. The findings obtained from this study are important in determining the resources needed to improve family poultry farming in Togo.

Key words: Family poultry, production performance, flock management, poultry diseases, Togo

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Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Agriculture plays a pivotal role in the socioeconomic development of Togo. It provides employment for approximately 54% of the working-age population and contributes 40% to total gross domestic product (GDP). There are 95.8% agricultural households, of which 70.1% practice agriculture and livestock farming simultaneously. Of this 70.1%, family poultry (FP) is practiced by 79.3%[1,2]; FP is defined as small-scale poultry production practiced by households using family labor and locally available food supplies. FP has had various designations over time, including smallholder FP, rural poultry, village chickens, local poultry, local chickens, free range poultry, indigenous chickens, native chickens and scavenging chickens.

Despite intensive efforts to develop the poultry sub-sector, FP remains extremely important in developing countries, especially those in Africa and Asia. FP is a valuable asset to local populations because it is not only a source of food and employment but also critical for establishing and maintaining strong sociocultural ties in the community, especially in disadvantaged groups and less-favored areas[3,4]. FP accounts for approximately 80% of the world's poultry stocks in many developing countries[5]. In these countries, villagers raise poultry to meet household food demands and as additional sources of income[6]. FP flocks are important providers of eggs and meat, as well as being valued in religious and cultural life[3]. The meat and eggs of native breeds of poultry birds are preferred by many consumers over the same products from commercial poultry due to differences in taste, appearance and suitability for rural dishes[7]. In Sub-Saharan Africa (SSA), FP allows households to improve their diet and income, especially for women[8,9]. Therefore, FP is crucial for combating rural poverty.

One of the most important and desirable characteristic of local poultry breeds is their hardiness, which refers to their ability to tolerate harsh environmental conditions and poor husbandry practices without a significant loss in production[3]. FP is an appropriate system that makes the best use of locally available resources. Local poultry breeds perform better than their exotic counterparts and their crosses in terms of survivability, disease resistance and vigilance against predators[10]. Local breeds are an important reservoir of genomes that may be used in the future to produce hybrid birds[11]. Furthermore, local breeds require extremely low capital, labor and space, which allows their production to be practiced even by landless individuals.

The potential for indigenous poultry production to contribute optimally to food and nutrition security can only be realized if the constraints to production are addressed[12]. The reproductive performance of local breeds is generally low; in particular, hens lay only 30-80 small eggs annually per hen under smallholder conditions. In contrast, commercial strains can produce up to 300 eggs annually per hen[11]. The most common cause of the high mortality rates observed in indigenous birds-particularly in tropical countries-is Newcastle disease[12]. Although FP production in Togo is growing rapidly, there is a lack of data on FP practices in this region. Therefore, the purpose of this study was to obtain information on FP practices in Togo.

MATERIALS AND METHODS

Experimental site: A field survey was undertaken over a period of 45 days during January and February of 2016 in the five economic regions of Togo. Togo is a West African country which is located between 6° and 11° N latitude and between 0° and 1°40 E longitude, with a total area of 56,600 km^2 (Fig. 1). The average rainfall in Togo varies between 800-1,400 mm, with an average temperature of 27-28°C[13].

Data collection: For this study, data were collected in the field by trained investigators. Sometimes the difficulty of speaking the local language necessitated the intervention of translators. A sample of 1,468 households were randomly selected across the 36 prefectures in the five regions of Togo (Table 1, Fig. 1). Semi-structured questionnaires were used to collect information through individual interviews, mainly about flock ownership pattern, occupational status, rearing species and major constraints for FP development.

Statistical analysis: Data were analysed using Microsoft Access, 2013 and SPSS/PC (statistical Package for the Social Science/Personal Computer) version 16.0.

RESULTS

Flock ownership patterns, occupational status and poultry species reared: Table 2 shows flock ownership patterns, occupational status and reared poultry species. Across regions, whereas the entire family owned the FP in households (26.56%), men were mostly owners (65.48%). With respect to occupations, 91.35% of households surveyed practiced agriculture as their main occupation. Approximately 69% of respondents reared only poultry birds.

Flock size was related to the household's poultry farming objectives (Table 3). The combination of two objectives, namely, home consumption and income, dominated across

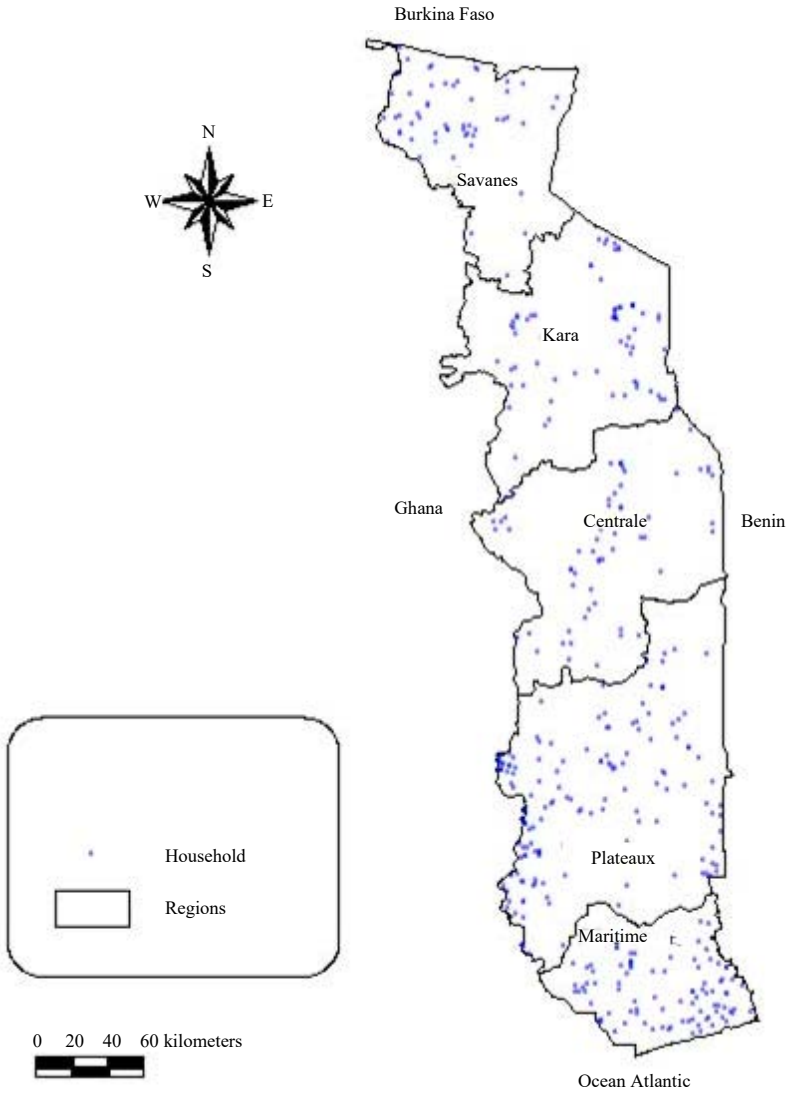

Fig. 1: Map of Togo showing households selected in the different regions

all regions (39.37%), followed by income (25.19% on average). On the average 16.89% of households kept birds for home consumption, cultural reasons and income. Overall, 7.09% of households kept birds for home consumption only.

Birds were most often purchased (87.10%) for the purpose of forming the foundational poultry flock (Table 4). Body size was the most influential trait (21.67%) for the selection of the foundational stock while the combination of body size and plumage most influenced the stock selection (25.59%) (Table 5) criteria of respondents. Flock type was composed mainly of chickens (n = 50±7), followed by pigeons (n = 31±7), Guinea fowls (n = 23±5) and ducks (n = 19±7) (Table 6).

Table 7 shows household flock management, feed ingredients and sources of water provided to the flock. The results revealed that family labor such as men, women and youth were involved in different poultry rearing tasks (26.62%). The flock was mainly managed by males (46.98%). The management activities related to poultry production mentioned were providing food and water, brooding of chicks, setting of hatching eggs, taking care of brooding hens, sweeping and disinfecting shelters, maintaining drinkers and feeders and monitoring the flock at night for thieves or predators. Across all five regions, farmers reported that cereals were the major feed ingredients used, particularly maize (95.09%), followed by millet (43.71%) and sorghum (34.49%).

Table 1: Number of households selected per prefecture

Regions	Prefectures	No. of households	Total
Centrale	Blitta	39	194
	Plaine de Mô	30	
	Sotouboua	41	
	Tchamba	45	
	Tchaoudjo	39	
Kara	Assoli	40	267
	Bassar	38	
	Binah	45	
	Dankpen	20	
	Doufelgou	44	
	Kéran	40	
	Kozah	40	
Maritime	Avé	25	245
	Bas-Mono	32	
	Golfe	25	
	Lacs	41	
	Vo	25	
	Yoto	42	
	Zio	55	
	Agou	34	
Plateaux	Akébou	41	484
	Amou	39	
	Anié	40	
	Danyi	46	
	Est-Mono	46	
	Haho	40	
	Kloto	30	
	Kpélé	35	
	Moyen-Mono	45	
	Ogou	48	
	Wawa	40	
	Cinkassé	45	
Savanes	Kpendjal	55	278
	Oti	50	
	Tandjoaré	55	
	Tône	73	
Total		1468	1468

Table 2: Flock ownership patterns, occupational sectors and reared species

	Frequency (%)					
	Maritime	Plateaux	Centrale	Kara	Savanes	Mean
Ownership						
Male	66.50	57.46	68.64	59.91	74.90	65.48
Female	14.29	7.33	7.69	3.88	0.77	6.79
Infants	2.46	1.22	1.78	0.00	0.39	1.17
Family	16.75	33.99	21.89	36.21	23.94	26.56
Occupational sector						
Agriculture	89.16	92.93	89.18	89.06	96.40	91.35
Others	10.84	7.07	10.82	10.94	3.60	8.65
Rearing species						
Poultry only	62.00	66.02	62.72	69.49	85.82	69.21
Poultry and others	38.00	33.98	37.28	30.51	14.18	30.79

Household food leftovers, harvest residues, insects and local beer brewing waste products were also frequently used (35.32, 26.78, 26.67 and 20.99%, respectively). The main sources of water supply reported for poultry were wells (36.07%) and boreholes (32.97%).

Major contributors to flock loss: Several factors caused losses in FP flocks. Disease (66.16%), theft (20.17%) and predation (11.54%) were reported as the leading causes of poultry loss (Table 8). The diseases commonly encountered were: Newcastle disease, coccidiosis, smallpox, bronchitis,

Table 3: Poultry farming objectives

	Frequency (%)					
Objectives	Maritime	Plateaux	Kara	Centrale	Savanes	Mean
Home consumption only	5.41	11.00	4.89	8.23	5.93	7.09
Home consumption and cultural reasons	0.00	1.47	2.72	1.23	1.27	1.34
Cultural reasons	1.80	0.00	2.17	4.12	7.63	3.14
Home consumption and income	46.40	55.01	45.65	21.40	28.40	39.37
Income and cultural reasons	1.35	0.24	1.09	3.29	1.27	1.45
Income only	37.84	16.38	19.02	22.22	30.51	25.19
Home consumption, cultural reasons and income	6.31	9.29	19.02	34.57	15.25	16.89
Home consumption, cultural reasons, gift and income	0.90	6.61	5.44	4.94	9.74	5.53

Table 4: Origin of the foundational poultry flock

	Frequency (%)					
Origin	Chicken	Guinea fowl	Duck	Turkey	Pigeon	Mean
Purchase	76.89	88.26	86.26	93.65	90.44	87.10
Gift	8.13	3.91	4.40	0.00	2.21	3.73
Inheritance	3.93	3.04	2.47	0.00	1.47	2.18
Entrusting	2.92	2.17	1.37	3.17	1.47	2.22
Purchase, inheritance, gift, entrusting	8.13	2.62	5.50	3.18	4.41	4.77
Total	100.00	100.00	100.00	100.00	100.00	100.00

Table 5: Breed choice criteria during purchase

	Frequency (%)					
Criteria	Maritime	Plateaux	Centrale	Kara	Savanes	Average
Best hatching	15.85	15.64	3.55	5.85	5.46	9.27
Body size	12.02	23.31	28.37	25.73	18.91	21.67
Plumage	3.28	5.83	5.68	15.79	11.34	8.38
Best hatching and body size	38.25	17.48	8.51	2.34	10.92	15.50
Body size and plumage	9.84	14.73	38.30	26.90	26.05	23.16
Best hatching and plumage	1.09	0.92	2.13	6.43	2.10	2.53
Best hatching, body size and plumage	19.67	22.09	13.46	16.96	25.22	19.48
Total	100.00	100.00	100.00	100.00	100.00	100.00

Table 6: Poultry species and flock size in households

Species		Maritime	Plateaux	Centrale	Kara	Savanes	Mean	SD
	Male	7	6	8	6	10	7	2
Chicken	Female	14	12	15	14	19	15	3
	Young	31	21	29	30	29	28	4
	Total	52	39	52	50	58	50	7
	Male	3	3	7	6	6	5	2
Guinea fowl	Female	8	5	9	9	13	9	3
	Young	13	6	9	11	8	9	3
	Total	24	14	25	26	27	23	5
	Male	3	3	3	3	2	3	0
Duck	Female	7	4	6	6	5	6	1
	Young	21	9	9	6	5	10	6
	Total	31	16	18	15	12	19	7
	Male	3	3	3	9	5	5	3
Pigeon	Female	6	9	10	11	8	9	2
	Young	22	15	10	22	16	17	5
	Total	31	27	23	42	29	31	7

salmonellosis, vitamin deficiency and intestinal worms. Although some respondents were unable to diagnose certain diseases but were familiar with signs and symptoms of illness, such as diarrhea, drowsiness, cough, muscle weakness, head enlargement, nasal discharge, paralysis of the legs of wings, bloody droppings, lice, ticks, tremor, bent or twisted neck, labored or noisy breathing, worms in droppings, hanging wings and swelling of the eyes.

Table 7: Flock management, feed ingredients and type of water supplied

	Frequency (%)					
	Maritime	Plateaux	Centrale	Kara	Savanes	Mean
Responsible for activities						
Male	32.47	39.70	45.81	48.63	68.28	46.98
Female	39.39	20.61	17.88	20.39	11.94	22.04
Young	3.90	2.39	7.82	4.71	2.99	4.36
Male, female, young	24.25	37.32	28.49	26.28	16.79	26.62
Feed ingredients						
Maize	93.55	97.10	89.69	96.22	98.90	95.09
Feed	14.11	3.32	10.82	3.39	3.31	6.99
Sorghum	9.27	20.12	39.18	51.32	52.57	34.49
Millet	29.84	28.22	45.36	44.90	70.22	43.71
Leftovers	52.42	16.80	41.24	41.88	24.26	35.32
Local bier dresh	9.68	9.13	11.34	34.71	40.07	20.99
Cake	5.24	3.11	5.67	3.39	6.99	4.88
Bran	29.84	19.50	15.98	4.90	21.32	18.31
Harvest residues	25.00	42.95	28.35	18.49	19.12	26.78
Insects	10.89	9.54	28.35	19.24	65.81	26.77
Soya	2.82	7.47	11.86	8.67	8.09	7.78
Fish meal	2.82	2.90	2.06	3.77	2.94	2.90
Rice	7.66	12.45	12.89	13.58	24.26	14.17
Cassava meal	8.47	11.00	0.00	0.00	0.00	3.89
Source of water						
Watercourse	1.63	23.97	1.04	3.38	5.47	7.10
Drilling water	20.41	20.87	37.82	49.25	36.50	32.97
Rainwater	2.04	2.69	3.63	0.75	1.46	2.11
Well water	41.42	20.45	44.56	31.58	42.34	36.07
Tap water	6.94	6.20	3.63	5.23	2.55	4.91
Watercourse, drilling, well, rain	27.75	25.81	9.33	9.77	11.65	16.86

Table 8: Distribution of factors causing loss in flocks

	Frequency (%)					
	Maritime	Plateaux	Centrale	Kara	Savanes	Mean
Factors causing loss						
Diseases	51.07	62.28	57.06	74.01	86.40	66.16
Predators	16.31	14.01	16.94	7.48	2.94	11.54
Thefts	30.94	22.20	22.03	15.74	9.92	20.17
Accidents	1.71	1.51	3.96	2.75	0.74	2.13
Type of care						
Traditional	46.43	40.37	54.01	47.37	44.92	46.62
Veterinary	29.91	36.70	34.77	26.32	38.04	33.15
Traditional and veterinary	23.66	22.93	11.23	26.32	17.03	20.23
Extension services						
Counseling	39.52	46.68	50.00	63.00	76.98	55.24
No counseling	60.48	53.32	50.00	37.00	23.02	44.76
Breeders' opinions on extension services						
Very satisfied	5.49	2.43	5.68	4.03	2.22	3.97
Satisfied	83.52	75.24	82.95	78.52	86.67	81.38
Unsatisfied	9.89	17.96	10.23	10.07	9.44	1.52
Very unsatisfied	1.10	4.37	1.14	7.38	1.67	3.13

To deal with poultry diseases, 33.15% of respondents provided veterinary care to the birds, whereas herbal methods were used by 46.62% to treat diseases. Both methods were used indiscriminately by a significant proportion (20.23%) of respondents (Table 8). The veterinary products used by respondents included dewormers, antibiotics, anticoccidials and vitamins. The brands used included: Vsp®, Vpv®, Utriclyne®, Itanew®, Piperazine®, Tetracycline®, Oxyferent4®, Olivitasol®, Levalap®, Amprolium®, Keproceryl®, Vitaflash®, Vitaperos®, Vermos®, Vetoquinol®, Oxytetracycline®, Alfaceryl®, Tylo-Dox®. Some of the farmers administered drugs designed for human use that are often not approved for use in poultry production. These drugs included Albendazol®, Paracétamol®, Chloroquine®. Various local plants are used for ethnoveterinary

treatments, including *Azadirachta indica*, *Mangifera indica*, *Aloe vera*, *Khaya anthotheca*, *Anacardium occidentale*, *Khaya senegalensis*, *Vitellaria paradoxa*, *Milicia excelsa*, *Cassia occidentalis*, *Adansonia digitata*, *Capsicum* sp. and *Citrus limon*.

The results indicated that 55.24% of respondents benefited from extension services, while 81.38% of respondents claimed they were satisfied with the support provided. Extension services were found to cover only half of the respondents (Table 8).

DISCUSSION

In line with the result of present study, a Nigerian study reported that majority of the men owned the FP flock (55.6%)[14]. Conversely, another study reported that poultry are the only livestock under independent control of women in many low- and middle-income countries[12]. For example, the majority of women owned the household's FP flock in Zimbabwe (88.9%) and Bangladesh (84.62%)[15,16]. Small-scale poultry rearing by women is encouraged because the resultant income generated would be under their complete control, thereby empowering them, which enhances household food security[12]. Gueye[5] indicated that in most African rural areas, the ownership of poultry is an outcome of the social, cultural and religious contexts of a society.

Our results revealed that 92.81% of households surveyed practiced agriculture as their main occupation. Likewise, Islam *et al*.[17] reported that 43% of FP farmers in Bangladesh were employed in the agricultural sector. In the five regions of Togo, respondents involved in agricultural or other occupational sectors, diversified their employment sources by engaging in poultry activities to supplement the family income. Wong *et al*.[12] pointed out that small-scale poultry production is commonly used as part of mixed or integrated farming systems, which allows farmers to use resources efficiently. Thornton[18] reported that livestock serve as financial instruments by providing households with an alternative for storing savings or accumulated capital; the livestock can be sold and transformed into cash as needed.

About poultry farming objectives, our findings are in contrast to studies carried out in Nigeria and Burkina-Faso where Alabi and Aruna[19] and Ouedraogo *et al*.[20] recorded that 53 and 69% of farmers are rearing FP for income only. Poultry-keeping in developing countries yields more diverse benefits to households. The use of native strains in tropics varies from region to region and from community to community within a given region[3].

With respect to the origin of the poultry flock foundation, previous studies carried out in Kenya reported similar findings where many smallholder farmers acquired their flock through direct purchase (74 and 78%, respectively)[21,22]. The results of the breed selection criteria during purchase in the present study are consistent with those of Salces *et al*.[7] in Philippine where live weight was the most important consideration, followed by plumage color. Ndiweni[15] asserted that flock selection was based on breed quality in terms of productivity, resistance to diseases, size and plumage. Plumage color was reported as a useful beauty trait because some ritual ceremonies prefer certain colours (red, combination of greyish white and black and a combination of greyish white, black and red and white) over others[23].

Our findings on household flock management conflicts with those of previous reports where surveys carried out in some developing countries revealed that women were dominated in most of the activities related to poultry farming[4]. As regards feed ingredients, our results are similar to those of a previous study conducted in South Africa, where 81% of FP farmers fed maize to birds[24], whereas rice/broken rice was the main ingredient used in India (92.50%)[25]. For the water source, similar results were reported by Kumar *et al*.[25] who stated that 48.33% of farmers used water from a pond followed by water from a well (34.17%).

With respect to the major causes of flock loss, the results of the present study is in accordance with the results of Mohammed[26] who reported that the main threat perceived by Ethiopian farmers (63.8%) in FP losses was disease. In South Africa, most farmers (81.5%) acknowledged that health-related problems were a major challenge in the FP sector[27]. In Bangladesh also, Popy *et al*.[16] reported that the death of 76.92% of poultry occurred due to a variety of diseases and Newcastle disease was identified as the major cause of death in FP. Wong *et al*.[12] asserted that the most common cause of high mortality observed in small-scale poultry flocks, particularly in tropical countries, was Newcastle disease. In the absence of prior exposure or protective vaccination, Newcastle disease can result in>70% mortality of a flock[28].

The use of other plant species for poultry disease management that had also been reported in previous studies include *Aloe vera*, *Capsicum sp*. and *Anarcadium occidentale*[29,30]. In Ethiopia, backyard producers and semi-intensive producers of chicken generally use ethnoveterinary medicine[31].

In the present study, 55.24% of respondents benefited from extension services. Previous study carried out by Koyenikan[32] in Nigeria revealed that poultry extension was

minimal due to poor contact with extension services and low coverage area. In many rural areas in low- and middle-income countries, the large size of the coverage area and the lack of resources and infrastructure can limit veterinary and extension services. Where they exist, they are often focused on crop or ruminant production, with little healthcare or advice accessible to small-scale poultry keepers[12].

CONCLUSION

Important constraints in the current status of FP production in Togo are identified in the current study. For the improvements in FP in Togo, researchers should continue to focus on disease control to reduce mortality, improvement of shelters and production performance, extension service needs and capacity building in order to provide information about management practices and training of farmers on appropriate technologies.

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