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Impact of north-south migration on eating habits: A comparative study of northern populations living in Côte d'Ivoire

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Abstract

Internal migration in Côte d'Ivoire, particularly from the north to the south, influences the dietary habits of populations. However, few studies have examined the effects of these migrations on the eating practices of internal migrants from the northern regions in Côte d'Ivoire. This cross-sectional study compared the dietary habits of 210 people from the Sénoufo and Tagbanan ethnic groups, who originated from the north (Korhogo, Katiola) and currently reside in the south (Abidjan, Grand-Bassam). Structured interviews and questionnaires using the food frequency method were used to collect sociodemographic and the dietary habits data of the populations. The results showed that northern migrants settled in the south adopt typical southern dishes, such as seed and okra sauces, accompanied by foods like attiéké and placali, along with animal proteins like fish and offal. They also consume more processed foods, including fast foods and industrial dairy products (Dèguè, cheese) compared to those who remained in the north. On the other hand, the populations living in the north maintain more traditional diets, with a higher consumption of local cereals and tubers (millet, maize, and yam) and vegetables (light sauces and leaf-based dishes). In conclusion, internal migration from the north to the south of Côte d'Ivoire leads to substantial changes in dietary habits, with a shift toward more urban and processed diets among migrants. These changes may affect the health of these populations, and exploring this would be essential to prevent the risk of chronic diseases.

Keywords: Internal migration; Dietary habits; Côte d'Ivoire; Processed foods; Traditional dishes

1. Introduction

Internal migration, defined as the movement of populations within national borders, is a global phenomenon influenced by economic, social, and environmental factors. According to the United Nations, more than 740 million people are internal migrants, a figure significantly higher than that of international migrants [1]. In Africa, about 75% of migration takes place within countries, reflecting regional socio-economic dynamics [2]. In West Africa, internal migrations are particularly common, with significant movements of rural populations to urban areas in search of better living conditions (World Bank, 2020). Côte d'Ivoire, as a regional economic hub, attracts a large number of internal migrants, particularly from the north to the south.

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Populations from northern regions of Côte d'Ivoire, such as Korhogo and Katiola, often migrate to southern cities like Abidjan and Grand-Bassam. This migration is generally motivated by the search for economic opportunities and better access to educational and healthcare infrastructures [3]. However, beyond socio-economic aspects, migration leads to significant changes in eating habits. Migrants from northern Côte d'Ivoire bring with them traditional dietary practices centered around cereals (millet, corn) and local vegetables, particularly Hibiscus leaves and other plants [4]. Upon settling in urban environments, these individuals are exposed to new foods, including processed products and ready-made meals, which can impact their nutritional health [5].

Research has shown that eating habits can change rapidly in a new context. However, in Côte d'Ivoire, few studies have focused on the effects of internal migration on the dietary practices of populations from the north. Existing studies have mainly focused on migrant populations from the central part of the country [6], leaving a gap in information regarding the eating practices of northern migrants.

The objective of this study is to assess and compare the eating behavior of people from northern Côte d'Ivoire residing in the north (Korhogo and Katiola) with those who have migrated to the south (Abidjan and Grand-Bassam). This comparison between the Sénoufo and Tagbanan peoples aims to better understand the effects of migration on the dietary habits of these populations and the potential implications for their health.

2. Materials and Methods

2.1. Study Type and Framework

This cross-sectional, descriptive, and analytical study was conducted in four cities in Côte d'Ivoire: Korhogo, Katiola, Abidjan, and Grand-Bassam. These locations were chosen to analyze the eating behavior of populations from northern Côte d'Ivoire, residing either in their region of origin (Korhogo and Katiola) or having migrated to the south of the country (Abidjan and Grand-Bassam). This choice is justified by the observed contrast in the eating habits of migrants compared to those who remained in their regions of origin, allowing for a comparative analysis of dietary practices based on the geographical context.

2.2. Study Period and Population

The study was conducted over a three-month period, from mid-March to mid-June 2023. It involved 210 participants, all originating from northern Côte d'Ivoire, aged between 16 and 84 years. This wide age range allows for a more comprehensive assessment of dietary practices across multiple generations. The main inclusion criterion was being a native of the north, and those who did not meet this criterion were excluded from the survey.

2.3. Sampling and Subject Selection

Stratified sampling was used to ensure that the subgroups (residents in the north and migrants to the south) were proportionally represented in the sample. The strata were defined by place of residence (north and south). Random sampling was then performed within each stratum to ensure an unbiased selection of participants. G*Power version 3.1 was used to calculate the necessary sample size, taking into account an effect size of 0.3; a probability error α of 0.05; a power of 95%; and a degree of freedom of 3. The calculation resulted in a minimum sample size of 191 participants, but after adjustment to account for anticipated non-responses or missing data, 210 individuals were retained. These participants were distributed as follows: 100 individuals residing in the north and 110 individuals in the south.

2.4. Nutritional Survey

Data were collected through face-to-face questionnaires, with particular attention given to the participants' understanding of the questions through a pilot phase. The questionnaires covered sociodemographic characteristics (age, sex, education level, occupation, marital status, and number of years of residence in the locality) and dietary practices (number of meals per day, food groups consumed, frequency of consumption).

The retrospective method of food frequency consumption was used to assess dietary habits and preferences. Dishes were grouped into six major food categories: (i) cereals, tubers, and roots; (ii) animal proteins; (iii) fruits, vegetables, and legumes; (iv) milk and dairy products; (v) sweet foods and beverages; (vi) fatty foods. Local dishes, some of which are not common to all cultures, were described to facilitate comparison (Table 1).

Table 1 List of Some Local Dishes and Their Characteristics

Local Dishes	Nutritional Characteristics
Tchôhôron	Bean leaf sauce (*Phaseolus vulgaris L)* mixed with fresh peanut powder (*Arachis hypogaea*)
Dâh + peanut	Hibiscus leaf (*Hibiscus sabdariffa L)* sauce mixed with peanut paste. *Arachis hypogaea)*
Vegetable sauce	Sauce made from tomato, onion, chili pepper, cabbage, zucchini...
okra sauce	Sauce made from fresh or dried okra, ground into powder (*Abelmoschus esculentus*)
Leaf sauces	Sweet potato leaf sauce. (*Ipomoea batatas*)
soumbala Sauce	Fermented néré seed sauce. (*Parkia biglobosa*)
Palm nut sauce	Palm seed pulp sauce (*Elaeis guineensis*)
Gouagouassou	Eggplant (*Solanum Torvum)* and fresh okra(*Abelmoschus esculentus*) sauce
Corn tô.	Cornmeal cooked in water (*Zea mays*)
Akassa	Cooked corn dough (Zea mays) in water.
Millet tô	Millet flour cooked in water(*Pennisetum glaucum*)
Fonio couscous.	Fonio steamed (*Digitaria exilis*)
Abolo	Steamed rice flour dough.
Attiéké	Steamed cassava semolina (*Manihot esculenta*)
Placali	Cooked cassava dough in water. (*Manihot esculenta*)
Attoukpou	Steamed cassava semolina, then compacted (*Manihot esculenta*)
Kongodé	Cassava flour cooked in water (*Manihot esculenta*)
Foutou banana	Plantain banana (Musa paradisiaca) and cassava (Manihot esculenta) cooked in water and then pounded.
Foufou	Plantain banana (Musa paradisiaca) boiled, then mashed and mixed with palm oil.
Dèguê	Curdled milk with millet semolina.
Fatty rice	Rice cooked with tomato paste and oil in water.

2.5. Data Analysis

The data were entered into Excel 2013 and analyzed using IBM SPSS Statistics software, version 20.0. Chi-square tests (χ^2) were used to assess the associations between sociodemographic variables and dietary practices, with a significance level set at 5%. The results were presented in the form of means, frequencies, and percentages, accompanied by standard deviations to assess the variability of the data.

2.6. Ethical Considerations

The protocol for this study was approved by the National Committee for Ethics and Life and Health Sciences (CNESVS) under reference N/Réf: 215-23/MSHP-CMU/CNESVS-km. All participants provided their informed consent prior to their inclusion in the study, and measures were taken to ensure the anonymity and confidentiality of the collected information.

3. Results

3.1. Socio-demographic characteristics

The results of the sociodemographic characteristics are presented in Table 2. The population consisted of more women (54% in the north and 50.5% in the south) than men (46% in the north and 49.5% in the south). The majority (50% in the north and 54% in the south) were aged between 31 and 50 years. The populations in the south have a higher level

of education than those in the north (56% in the south compared to 47% in the north). More than half of both populations engage in liberal professions (60% in the north and 53.2% in the south). Regarding marital status, 44% of people living in the north are cohabiting. In contrast, the populations in the south have a roughly equal percentage of single individuals (36.7%) and those in couples (cohabiting 37.6%).

Table 2 Socio-demographic characteristics

Sociodemographic Parameters	**Northern Population (n=100)**		**Southern Population (n=110)**	
	numbers	**%**	**numbers**	**%**
Sexe				
Men (n=100)	46	46	54	49,5
Women (n=110)	54	54	56	50,5
Age				
16-30 years	25	25	30	27,5
31-50 years	50	50	54	49,5
51-70 years	22	22	22	19,3
71-84 years	3	3	4	3,7
Education level				
Unschooled	40	40	31	28,4
Primary	12	12	18	15,6
Secondary	31	31	29	26,6
Higher education	16	16	32	29,4
Profession				
liberal profession[1]	60	60	59	53,2
office worker	1	1	8	7,3
student	5	5	15	13,8
Unemployed	3	3	1	0,9
Housewife	2	2	8	7,3
government employee	11	11	8	7,3
retired	3	3	8	7,3
worker*	15	15	3	2,7
marital status				
single	33	33	40	36,7
Common-law marriage	44	44	42	37,6
married	18	18	24	22
Widower/widow	5	5	4	3,7

* housekeeper, labourer, pump attendant

3.2. Population Movement

The distribution of migration types within the northern and southern populations of Côte d'Ivoire is recorded in Table 3. The data show three categories of movement: no movement, partial migration, and permanent migration. Thus, more than half of the northern population had engaged in partial migration, while 46% had not moved. However, 75.2% of

individuals living in the south had undergone permanent migration, compared to 24.8% who have lived in the south since birth.

Table 3 Different Migrations of the Surveyed Populations

Migration	Northern Population		Southern Population	
	numbers	%	numbers	%
no movement	46	46	28	24,8
partial migration	54	54	-	-
permanent migration	-	-	82	75,2

3.3. Dietary Practices

3.3.1. Number of Meals Taken per Day

Figure 1 presents the number of meals taken per day. The majority of both populations (73% in the north compared to 66.1% in the south) have 3 meals per day. However, just over a quarter (26%) of the northern population had an intake lower (2 meals/day: 22%) or higher (≥ 4 meals/day: 4%) than the average of 3 meals per day. In contrast, a third (33.9%) of the people residing in the south had an intake lower (2 meals/day: 22%) or higher (≥ 4 meals/day: 11.1%) than the average of 3 meals per day.

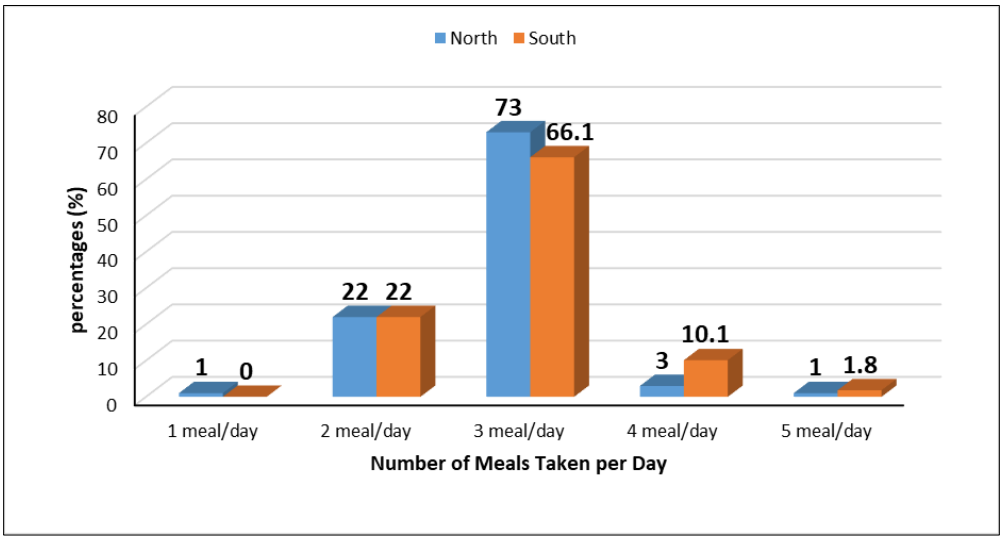

Figure 1 Number of Meals Taken per Day

3.3.2. Consumption of Dishes Based on Cereals, Tubers, and Roots

Consumption of Dishes Based on Cereals

Figure 2 presents the frequencies of cereal consumption. The results show a significantly higher consumption of rice in the South, with 81.6% of respondents consuming rice five times or more per week, compared to only 65% in the North. The consumption of corn tô does not show a significant difference between the North and the South (χ^2 = 0.0886), although 30% of respondents in the North consume it 3 to more than 5 times a week compared to 21% of respondents in the South. The consumption of pasta is less frequent in both regions. However, 78% of respondents in the South report consuming pasta rarely or never, compared to 92.6% in the North. The chi-square test (χ^2 = 0.0022) confirms a significant difference in the consumption of this product between the two regions. The consumption of millet tô is very rare, especially in the South, where 100% of respondents reported consuming it rarely or never, compared to 90% in the North. The chi-square test (χ^2 = 0.0012) also shows that this difference is statistically significant. Similarly, fonio, akassa, and abolo are rarely or not consumed at all in both regions, especially in the North, with percentages ranging from 96.3% to 100%. The χ^2 values (0.1531 for fonio couscous, 0.0794 for akassa, and 0.3137 for abolo) indicate that there is no significant difference in the consumption of these dishes between the North and the South.

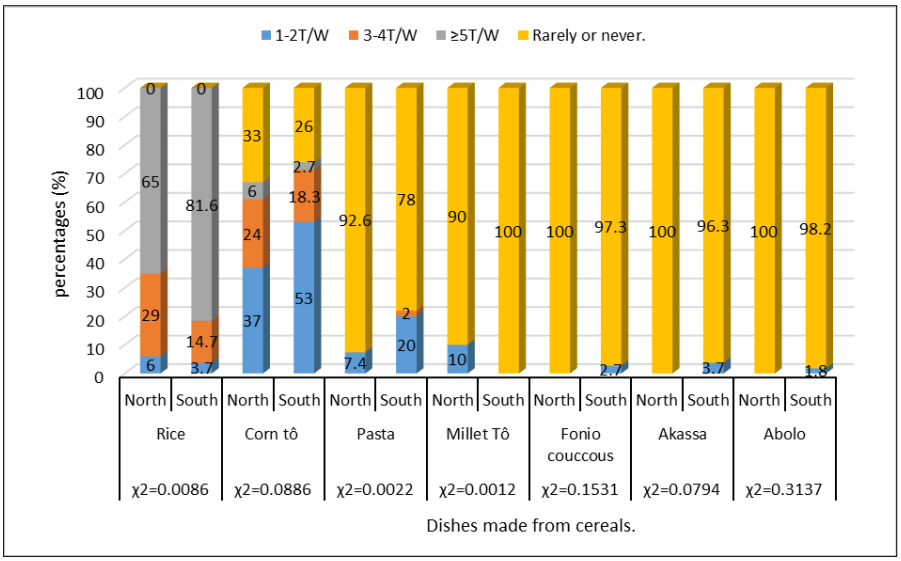

Figure 2 Frequency of Consumption of Dishes Based on Cereals

Consumption of Dishes Based on Tubers and Roots

The results of the frequency of consumption of tubers and roots presented in Figure 3 show that attiéké is significantly (χ^2 < 0.0001) more consumed in the South, with 31% of respondents consuming it five times or more per week, compared to only 6% of respondents in the North. Placali is also significantly (χ^2 < 0.0001) more consumed in the South than in the North, with 62.5% of respondents in the South reporting consuming it 1 to 2 times per week, compared to only 4% in the North. Foutou banana is significantly (χ^2 < 0.0001) consumed much less in the North than in the South, with nearly 99% of northern residents reporting consuming it rarely or never, compared to 55% in the South. Yam is consumed 1 to 2 times per week by more than 35% of residents in both regions. However, a significantly (χ^2 = 0.0084) more frequent consumption (more than 3 times per week) is observed among residents of the North (17%) than those in the South (3.7%). Kongodé, foufou, and attoukpou are consumed less in both regions. However, residents of the South show low consumption, resulting in significant differences (χ^2 = 0.0328; 0.0228; and 0.0412, respectively) in the consumption of these dishes between the two regions.

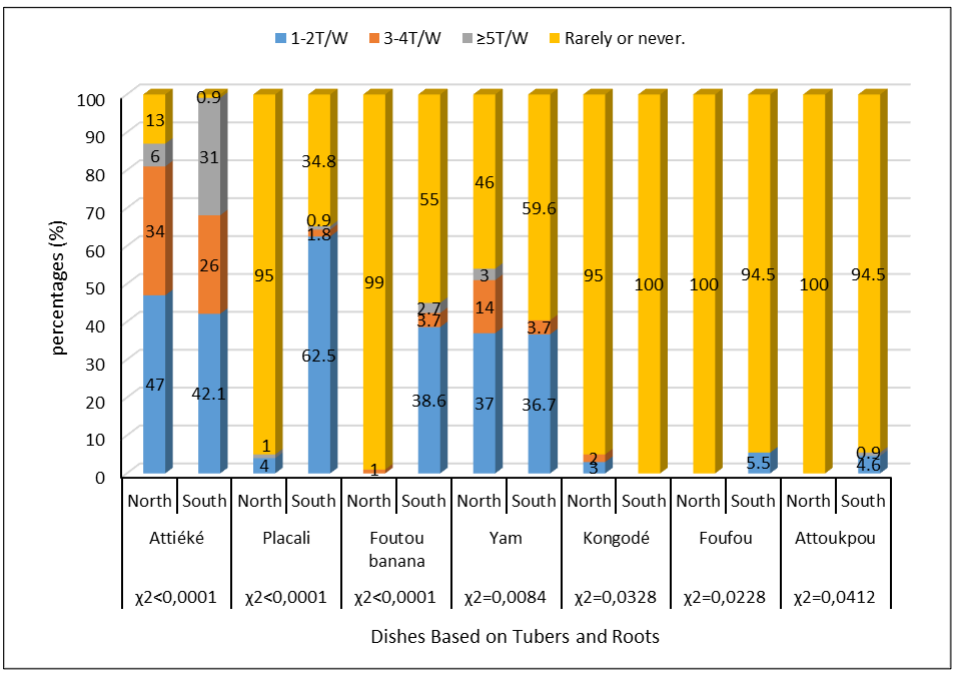

Figure 3 Frequency of Consumption of Dishes Based on Tubers and Roots

3.3.3. Consumption of Animal Proteins

The data collected on the consumption of sources of animal proteins (Figure 4) show a significantly ($\chi^2 < 0.0001$) higher consumption of fish among residents of the South, with 89.9% of the population consuming it more than 5 times per week, compared to only 63% in the North. The consumption of meat shows no statistically significant difference ($\chi^2 = 0.931$) between the North and the South. The majority of residents in the North consume more eggs than those in the South, with 57.9% of northerners consuming them 1-2 times per week, compared to 50% of residents in the South. However, no significant difference ($\chi^2 = 0.203$) is observed. The consumption of game meat is rare in both regions and shows no significant difference ($\chi^2 = 0.061$). However, a small portion (18%) of the northern population consumes it more than once a week, compared to 11% in the South. A very significant difference ($\chi^2 < 0.0001$) is observed in the consumption of offal, with higher consumption in the South (46.8%) at a frequency of 1 to 2 times per week.

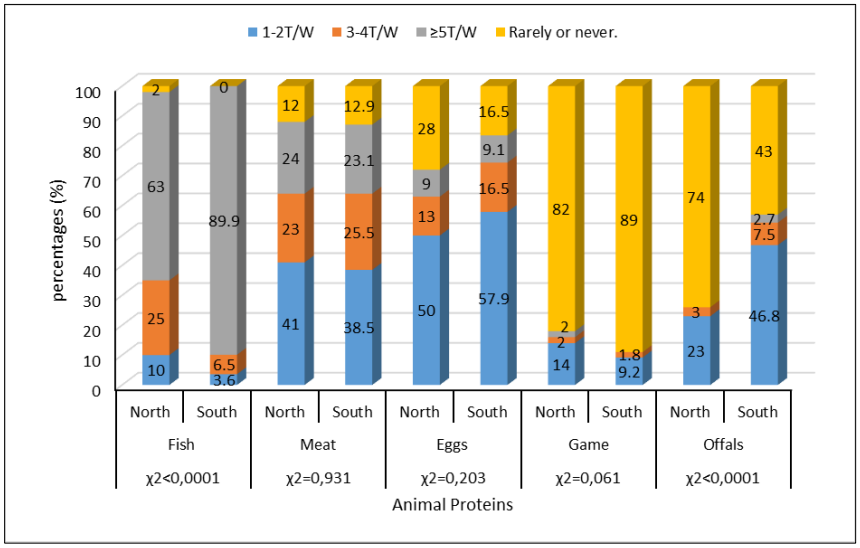

Figure 4 Frequency of Consumption of Animal Proteins

3.3.4. Consumption of Fruits and Dishes Based on Vegetables and Legumes

Consumption of Fruits

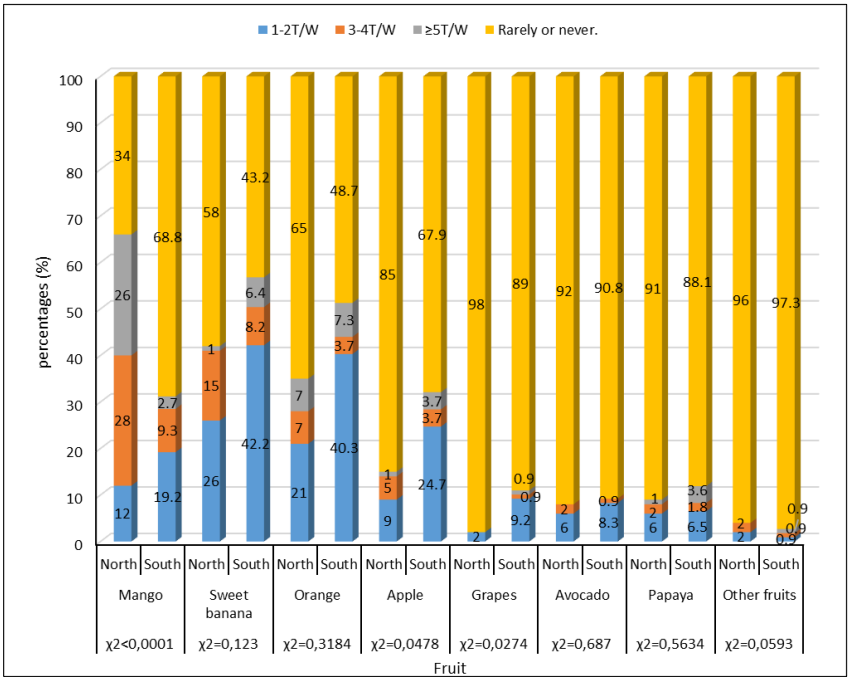

Figure 5 Frequency of consumption of fruit

The results of the frequency of fruit consumption are presented in Figure 5. A significantly higher consumption (five times or more per week) of mangoes is observed among people living in the North (26%) compared to those living in the South (2.7%). The consumption of sweet bananas and oranges shows no significant difference (χ^2 = 0.123 and 0.3184 respectively) between the two groups, although those in the North tend to consume these fruits less frequently. The frequencies of consumption of apples and grapes remain low in both groups but are significantly (χ^2 = 0.0478 and 0.0274 respectively) more consumed in the South than in the North. The majority of participants, whether from the North or the South (88.1% to 98%), report rarely or never consuming avocado, papaya, and other fruits (pineapple, watermelon, pear, grapefruit, néré, large peas).

Consumption of Dishes Based on Vegetables and Legumes

The results presented in Figure 6 show the consumption of sauces in the two regions (North and South). The consumption of Tchôhôron, peanut sauce, soumbala, and Dâ + peanut sauces does not show any statistically significant difference between the North and the South (χ^2 = 0.1574; 0.3986; 0.3297; and 0.4711 respectively). The majority of participants in both groups rarely or never consume Tchôhôron and soumbala sauce (60% and 63% in the North vs. 70.7% and 72.5% in the South, respectively), while peanut and Dâ + peanut sauces are consumed 1 to 2 times per week (69% and 47% in the North vs. 72.5% and 51.3% in the South, respectively). A significant difference (χ^2 < 0.05) to very significant (χ^2 < 0.001) is observed in the consumption of eggplant, vegetable , okra, leaf, Dâ + soumbala, palm nut, and gouagouassou sauce. The eggplant, fresh or dried okra, and seed sauces are more commonly consumed in the South, where the majority of participants (85.4%, 74.3%, and 73.4% respectively) consume them 1 to 2 times per week, compared to only 48%, 49%, and 12% respectively in the North. Although the consumption of Gouagouassou remains low, it is also more consumed in the South, with 17.5% of Southerners consuming it 1 to 2 times per week. Conversely, the vegetable, leaf, and Da + soumbala sauces are more commonly consumed in the North, where 42%, 52%, and 22% respectively of participants consume them 1 to 2 times per week, compared to only 15.6%, 44%, and 2.8% in the South.

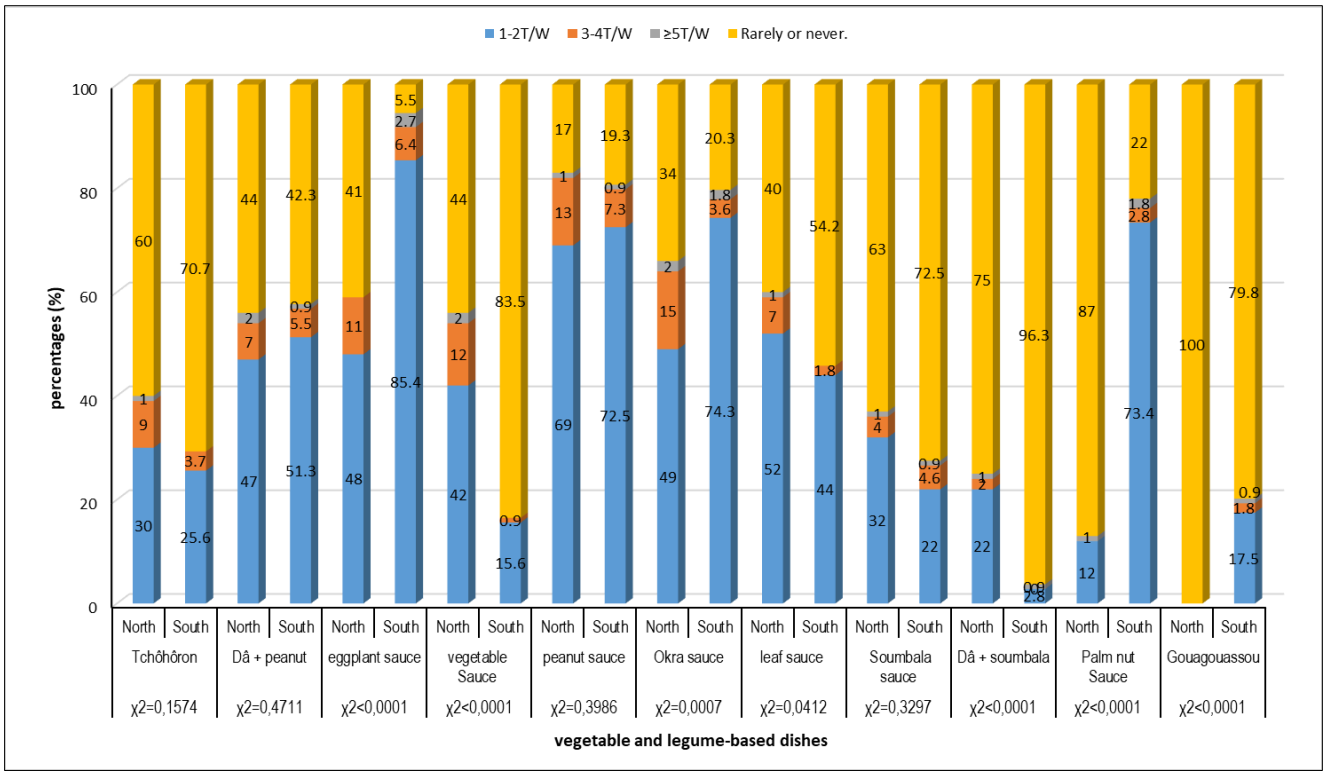

Figure 6 Frequency of consumption of vegetable and legume-based dishes

3.3.5. Consumption of Milk and Dairy Products

Figure 7 presents the results of the frequency of consumption of dairy products. No significant differences are observed in the consumption of powdered/liquid milk and curdled milk (χ^2 = 0.6164 and 0.0559, respectively) between the two regions, while significant differences are noted for the consumption of cow's milk, Dèguê, and cheese (χ^2 = < 0.0001; 0.0412; and 0.0027, respectively).

Although a small portion of the population consumes cow's milk, it is more frequently consumed (> 1 time per week) among residents of the North (21%) compared to those in the South (1.8%). In contrast, Dèguê and cheese are more frequently consumed (> 1 time per week) by the inhabitants of the South (46.8% and 11.9%, respectively) than by those in the North (28% and 1%, respectively)

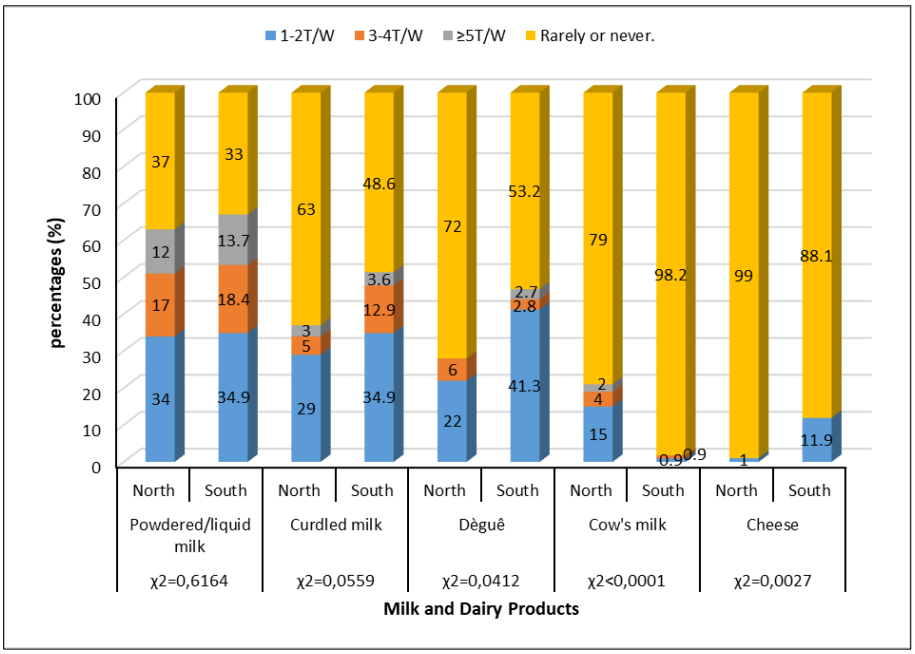

Figure 7 Frequency of Consumption of Milk and Dairy Products

3.3.6. Consumption of Sweet Foods and Beverages

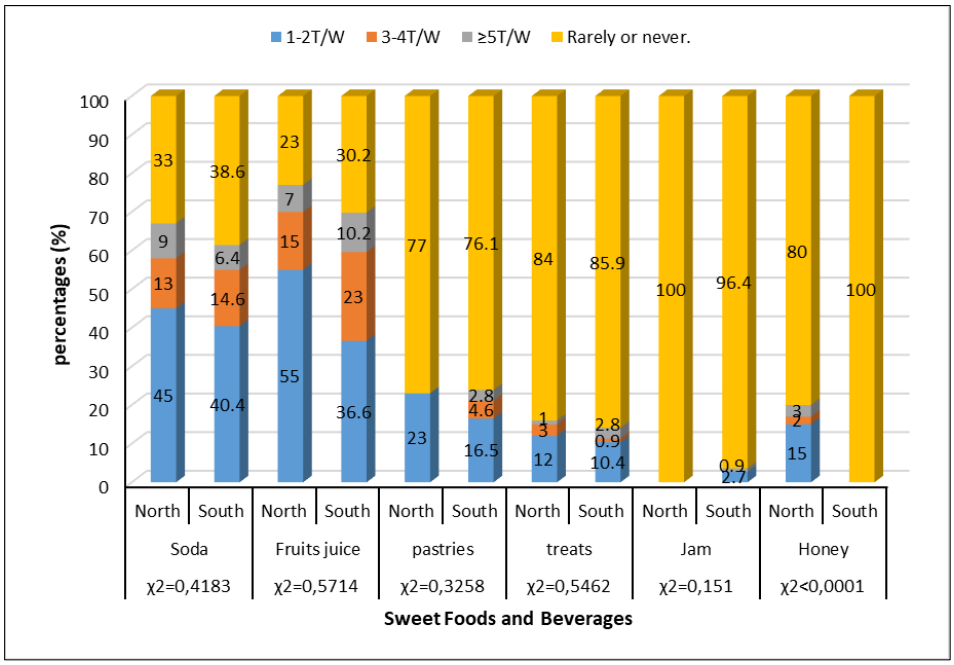

Figure 8 Frequency of Consumption of Sweet Foods and Beverages

Figure 8 presents the frequency of consumption of sweet foods and beverages. The consumption of soda, fruit juices, pastries, treats, and jam shows no significant difference (χ^2 = 0.4183; 0.5714; 0.3258; 0.151 respectively) between the two regions. However, fruit juices are more frequently consumed in the North, with 55% of respondents reporting that they consume them at least once a week, compared to 36.6% in the South. Conversely, jam is less consumed in the North,

where 100% of respondents indicate that they consume it rarely or never, compared to 96.4% in the South. Furthermore, honey consumption shows a significant difference ($\chi^2 < 0.0001$) between the North and South, with 15% of participants in the North consuming it 1-2 times a week, while 100% of participants in the South report consuming it rarely or never.

3.3.7. Consumption of Fatty Foods

Figure 9 presents the results of the frequency of consumption of fatty foods. The consumption of fatty rice, fried starchy foods, doughnuts, butter, and mayonnaise shows no statistically significant difference between the North and the South ($\chi^2 = 0.095$; 0.24218; 0.1399; 0.3819 respectively). However, oily rice and fried starchy foods are frequently consumed in the South (60.6% and 59.7% respectively), while doughnuts and butter/mayonnaise are commonly consumed in the North (41% and 39% respectively) 1-2 times per week. Additionally, 27.6% and 23.8% of the population in the South consume pastries and fast food 1-2 times per week, compared to 13% and 2% of the population in the North. This difference in consumption is statistically significant ($\chi^2 = 0.0002$ and $\chi^2 < 0.0001$ respectively).

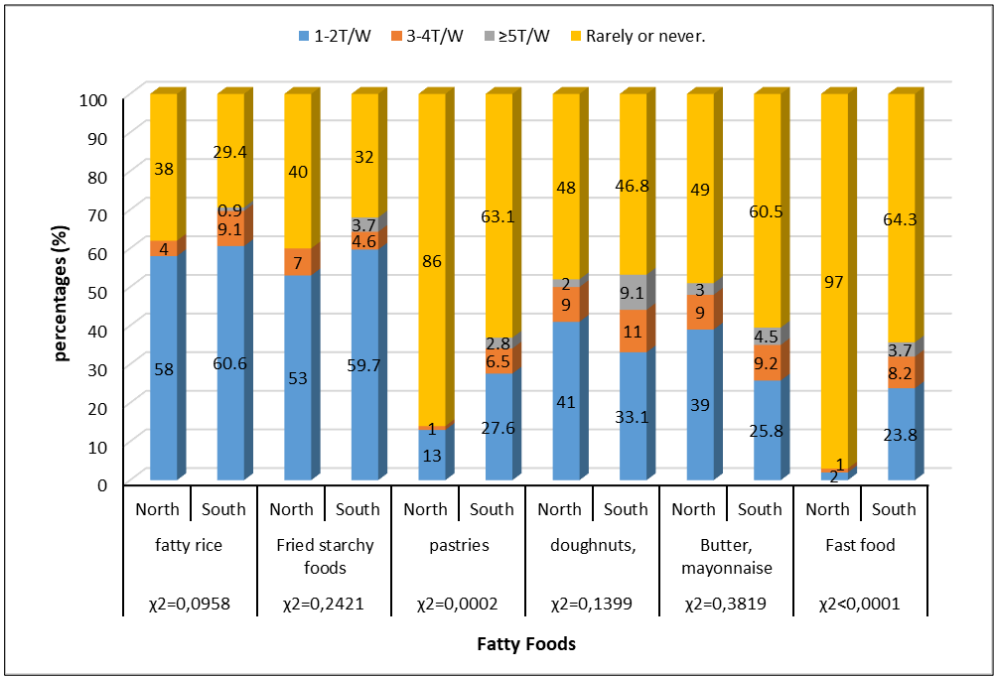

Figure 9 Frequency of Consumption of Fatty Foods

4. Discussion

The main objective of this study was to first evaluate the dietary behavior of the allogene populations in northern Côte d'Ivoire and then compare it with that of their fellow citizens living in the south of the country.

The sociodemographic results reveal several distinctions between the populations of northern and southern Côte d'Ivoire. The proportion of women is slightly higher in both regions, with moderate gaps between men and women, a typical trend in West Africa. The majority of respondents, aged 31 to 50 years, belong to an active age group, which influences dietary and socio-economic behaviors [7].

The higher level of education in the south (56%) compared to the north (47%) reflects better access to education in the south, which may influence dietary choices and behaviors. Professionally, a majority in both regions engage in liberal activities, highlighting a relative economic independence. Cultural differences appear in marital status: cohabitation is more common in the north (44%), while in the south, the population is more evenly divided between singles and couples living together (36.7% and 37.6%, respectively).

In terms of migration, the dynamics also differ. Partial migration is more frequent in the north, often linked to seasonal or economic movements, while permanent migration is dominant in the south (75.2%), likely due to the attraction of urban centers like Abidjan. These migrations impact social and economic structures in both regions.

Eating habits indicate that the majority of both populations consume three meals a day (73% in the north compared to 66.1% in the south), a stable dietary pattern influenced by the availability of resources. However, a minority in the north (26%) and the south (33.9%) shows variations in meal frequency, which could reflect different energy needs related to physical activity or socio-economic conditions.

The results show significant regional differences in cereal consumption in Côte d'Ivoire. Rice, a staple food, is consumed more frequently in the South (81.6% of respondents) than in the North (65%), reflecting a more pronounced cultural and economic dependency in the southern regions [8]. Corn meal (tô) is more commonly consumed in the North, although the difference is not statistically significant [9]. In contrast, pasta is less consumed in the North, where 92.6% of respondents report eating it rarely, compared to 78% in the South, likely due to the lower availability of processed products [10]. Millet, better suited to the climatic conditions of the North, is consumed more there than in the South, although its overall consumption remains low [8]. Finally, products like fonio, akassa, and abolo are rarely consumed in both regions, highlighting their low popularity [9].

The results highlight notable differences in the consumption of tubers and roots between northern and southern Côte d'Ivoire. Attiéké, a cassava-based product emblematic of the South, is much more frequently consumed by southern residents (31% consume it regularly), while its consumption is limited in the North (6%), which can be explained by the availability and regional specialization of this product [11]. Similarly, placali, another cassava derivative, is more common in the diet of southern populations (62.5% consume it once or twice a week) due to the economic importance of cassava in this region [9].

Conversely, foutou banana, though consumed in the South, is absent from the dietary habits of the North (99% of northern inhabitants never consume it). This difference reflects regional variations in production and food preferences [12]. Yam, on the other hand, shows a more balanced distribution between the regions, although northern inhabitants consume it more frequently (17% compared to 3.7% in the South), highlighting the crop's adaptation to northern climatic conditions. Other foods such as kongodé, foufou, and attoukpou, though rarely consumed in both regions, show significant differences in favor of the South, likely due to cultural factors and reduced availability in the North.

The results on the consumption of animal proteins between northern and southern Côte d'Ivoire reveal notable disparities. Fish, particularly abundant in coastal regions, is widely consumed in the South, where nearly 89.9% of inhabitants report consuming it more than five times a week, compared to only 63% in the North ($\chi^2 < 0.0001$). This difference is attributable to the South's geographic proximity to coastal areas and the availability of fishery products, as confirmed by [13].

As for meat, no significant difference was observed between the two regions ($\chi^2 = 0.931$), indicating relatively homogeneous consumption nationwide, despite the various forms in which it is consumed [14]. Regarding eggs, although higher consumption is observed in the North (57.9% compared to 50% in the South), this difference is not statistically significant ($\chi^2 = 0.203$). This may reflect socio-economic differences or dietary habits specific to certain rural areas, as suggested by [15]. Game meat consumption remains rare, with no significant difference between the two regions ($\chi^2 = 0.061$). However, game is consumed more frequently in the North due to local hunting traditions, especially in rural areas [16]. Finally, offal consumption is significantly higher in the South, where 46.8% of people consume it one to two times per week ($\chi^2 < 0.0001$). This trend may be linked to the cultural importance of offal in the local cuisine of the South.

The results show marked contrasts between the North and South of Côte d'Ivoire regarding fruit consumption, influenced by local availability and dietary preferences. Northern inhabitants consume significantly more mangoes (26% five times or more per week) than those in the South (2.7%), due to the seasonal abundance of this fruit in northern regions [17]. Conversely, sweet bananas and oranges do not show a significant difference between the two regions, although their consumption appears slightly more frequent in the South, likely due to more favorable climatic conditions. Apples and grapes, which are less traditional fruits in Côte d'Ivoire, are consumed marginally in both regions but more frequently in the South, probably due to better access in urban areas like Abidjan. The consumption of other fruits (avocado, papaya, pineapple, watermelon, etc.) remains generally low, reflecting limited access or less pronounced cultural preferences, particularly in rural areas.

The results show notable differences in the consumption of sauces between northern and southern Côte d'Ivoire. Sauces such as peanut sauce, Tchôhôron, and Dâ + peanut sauce are consumed similarly in both regions, with close frequencies (around 70% of respondents reporting consuming them 1 to 2 times per week), indicating a common preference for these dishes rich in plant-based proteins. Conversely, significant differences ($\chi^2 < 0.05$) are observed for okra, eggplant, palm nut,vegetable, leaf-based sauces, and Da + soumbala sauces. Okra and palm nut sauces are more popular in the

South, where they are regularly consumed due to the increased availability of vegetables and oilseeds in this tropical climate region. On the other hand, vegetable and leaf-based sauces, as well as Da + soumbala, are more commonly consumed in the North, where ingredients like baobab leaves and soumbala are more accessible, reflecting dietary adaptation to locally available resources. These differences highlight the influence of climatic conditions, local agricultural resources, and culinary traditions on dietary habits between the northern and southern regions of the country.

The results show a homogeneous consumption of powdered or liquid milk and curdled milk between northern and southern Côte d'Ivoire, likely due to their widespread availability [18]. However, significant differences exist for cow's milk, which is consumed more frequently in the North, where cattle farming is more common [14]. Conversely, Dèguê and cheese are consumed more in the South, where the food industry and urban habits influence these dietary choices [19].

The results reveal a generally similar consumption of sweet foods and beverages between the North and South of Côte d'Ivoire, particularly for sodas, industrial juices, pastries, and sweets, with no significant difference. However, distinctions arise for fruit juice and honey, which are consumed more in the North, where beekeeping is traditional [20]. Jam, on the other hand, is rarely consumed in either region, especially in the North.

The consumption of fatty foods shows distinct trends between northern and southern Côte d'Ivoire, despite the absence of statistically significant differences for certain foods such as fatty rice, fried foods, doughnuts, and mayonnaise. The South consumes more fatty rice and fried foods, while the North favors doughnuts and butter/mayonnaise. Additionally, the consumption of pastries and fast food is significantly higher in the South, due to urbanization [21].

5. Conclusion

In conclusion, this study revealed several notable statistical differences between the dietary behaviors of allogene populations originally from northern Côte d'Ivoire and those who migrated to the south. The results show that, although both regions share common staple foods such as rice, some eating habits have evolved with migration. For instance, northern allogene populations consume more millet and yam, while the south favors dishes like attiéké and placali, as well as animal proteins such as fish and offal. Regarding sauces, okra and palm nut sauces are more popular among migrants in the south, whereas clear and leaf-based sauces are mainly consumed in the north, reflecting adaptations to locally available resources. Lastly, in terms of dairy products, cow's milk is more consumed in the north, while foods like dèguê and cheese are more common in the south, likely linked to differences in livestock farming and the food industry.

These results illustrate the strong influence of geographical conditions, culinary traditions, access to local agricultural resources, and socio-economic dynamics, notably urbanization and access to processed products, on the food choices of populations in both regions.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of ethical approval

The protocol for this study was approved by the National Committee for Ethics and Life and Health Sciences (CNESVS) under reference N/Réf: 215-23/MSHP-CMU/CNESVS-km

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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