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The Nutritional and Microbiological Quality of Traditionally Dry Okra in the Central African Republic

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Abstract

Okra is one of the most consumed vegetables in the Central African Republic, given the difficulties of storing it fresh can lead to post-harvest losses and contamination. The objective of this study is to evaluate the physicochemical, nutritional and microbiological quality of dried okra. The analysis focused on samples of dried okra taken from the Bangui markets. The humidity level was carried out by the thermogravimetric method which consists of determining the quantity of water contained in the sample by prolonged heating. The protein assay is based on the principle of precipitation and involves using a neutral salt buffer solution to dissolve the proteins. The protein content is obtained by the ratio of the mass of the pellet to the initial mass of the powder, multiplied by 100. The determination of the lipids consists of the release of the total lipids by extraction using an organic solvent immiscible with water (hexane or methanol), the lipid extract is weighed after drying at 105˚C for one hour. The enumeration of microorganisms was done only on solid medium with the mass inoculation method then the incubation and counting of colonies were done according to the standards in force for each type of microorganism. The results obtained for the average humidity levels are 7.5% higher than the normal value, 11.82% for the average proteins, 1.49 for the lipid level and the microbiological analysis reveals the presence of characteristic colonies of *Escherichia coli* and fungi. The results obtained demonstrate the limit of sun drying by growers.

Keywords

Quality, Dried Okra, Nutritional, Microbiological

1. Introduction

Traditionally, certain vegetables are dried for preservation in order to reduce losses. Thus in the Central African Republic, there is a tradition of preparing and consuming dried products such as okra (*Abelmoschus esculentus*).

Also in the Central African Republic, we transform, stabilize and preserve the basic products most consumed by the population into ready-to-use products (flour, powder, etc.) and sell on the urban market.

Dried vegetable-based products, available all year round, are present and consumed in both rural and urban areas, even during the period when the supply of fresh products is high, due to recognized intrinsic virtues (more taste for dried onion than for fresh onion) or specific uses (use of leaves in traditional dishes) [1].

Drying okra also allows producers to better preserve their production during periods when vegetables are abundant and cost less on the market, to avoid post-harvest losses or to store and be able to sell them when demand is high and prices are attractive. In Africa, particularly in Central Africa, few producers or traders have cold rooms to preserve their products.

During the sun-drying process and during storage, these vegetables are exposed to microbes, dust and mycotoxin-producing molds such as certain species of Aspergillus spp, Penicillium spp, and Fusarium spp, if sanitary and hygiene rules are not respected and if the temperature and humidity of the product and the environment are not controlled.

These mycotoxins are very chemically stable, resistant to acidity and high temperatures [2]. They are responsible for chronic toxicity in humans and animals when they are assimilated into foodstuffs and ingested in small quantities over a long period of time. Mycotoxins can cause carcinogenic, mutagenic effects and allergies in humans [1].

In order to guarantee food safety, preserve the health of consumers, respect export standards and help the producer obtain better quality of his products in order to sell them better, this study was carried out in order to know the health risk to which the population is exposed by consuming products locally dried in the sun and sold in the Central African markets.

Physico-chemical, nutritional and microbiological analyzes will allow us to have an idea of the quality of its products.

2. Materials and Methods

2.1. Materials

Dried okra powder (*Abelmoschus esculentus*).

2.2. Methods Sampling

A survey and interviews on the drying and use of okra were carried out in 3 markets in Bangui and the surrounding area.

Preparation of okra powder (*Abelmoschus esculentus*)

- The okra is washed in water (sometimes without washing) and cut into rounds or slices, they are dried in the sun on tarpaulins or high tables. The slices of dried okra are then ground into powder and preserved.
- Drying time is three to four days depending on the sunshine and the size of

the okra cut.

Photo 1 shows the dried gpombo powder after sampling.

Photo 1. Sample of okra packaged in plastic bags.

Diagram 1 presents the different stages of drying okra.

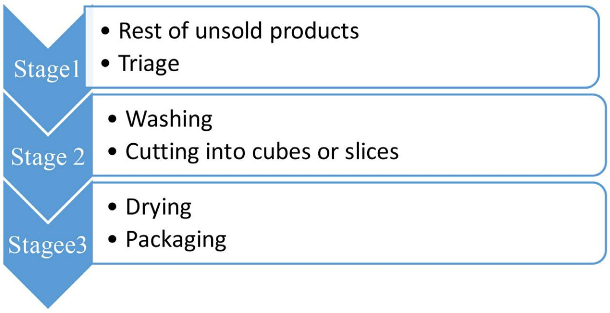


Diagram 1. Description of drying process.

2.3. Determination of Humidity Level

Thermogravimetric method

The thermogravimetric method is the reference method for the determination of water or total solids in seeds and/or foods.

The analysis requires the use of a ventilated oven or a vacuum oven, as well as a desiccator containing a drying agent.

1) Principle of the method:

Determination of the quantity of water contained in a seed or food by prolonged heating.

2) Operating mode:

The determination of the water content (TE) is carried out according to the AAOAC method (1990) [3]. based on the measurement of the mass loss of the samples after steaming at 105˚C ± 2˚C until complete elimination of free water and volatile matter. The vacuum cup is first cleaned, dried and weighed (M_0). A mass of 5 g of sample is weighed (M_1) then placed in an oven at 105˚C for 3 to 4 hours. The cup is removed from the oven, then cooled in a desiccator before being weighed (M_2) again. The results expressed represent the average of three tests and the water content expressed in percent is determined by the following formula.

$$\%\text{TE} = \frac{M_1 - M_2}{M_1 - M_0} \times 100$$

TH: humidity level; M_1: initial mass; M_2: final mass.

2.4. Nutritional Analyzes

Protein Dosage

The neutral salt solution method was used, which relies on protein precipitation.

Operating mode:

- Dissolve 1 g of okra powder in 20 ml of a Phosphate Buffer Salt solution, with slow stirring;
- Centrifuge for 10 minutes, at 5000 rpm;
- Collect the supernatant and measure its volume (the optical density DO);
- Mix equal volume of the supernatant with a solution of saturated ammonium sulfate, with slow stirring;
- Centrifuge the mixture at 5000 rpm;
- Collect, dry and weigh the pellet containing the proteins;
- The protein content is determined by the relationship: Protein content (%) = $M_2/M_1 \times 100$. In which: M_2 = mass of proteins in grams and M_1 = Initial mass of the sample [4].

2.5. Lipid Determination: Soxlhet Method

1) Principle: Consists of the release of total lipids by extraction using an organic solvent immiscible with water (hexane or methanol for example), followed by evaporation of the solvent and weighing of the lipid extract after drying at 105˚C for one hour [5].

2) Operating mode:

- Weigh the empty cartridge;
- Weigh 100 g of finely ground aliquot and dried in an oven for 24 hours at 119˚C;
- Introduce part of a crushed and oven-dried aliquot into a cartridge;
- The assembly of the Soxlhet is carried out in the presence of 500 ml of hexane and the temperature is set to 68˚C.
- Extraction for 20 to 30 minutes at Soxlhet;
- The lipids are obtained after evaporation of the solvent by ROTAVAPOR.
- Cooling for 30 minutes in a desiccator;
- Weighed and reported results.

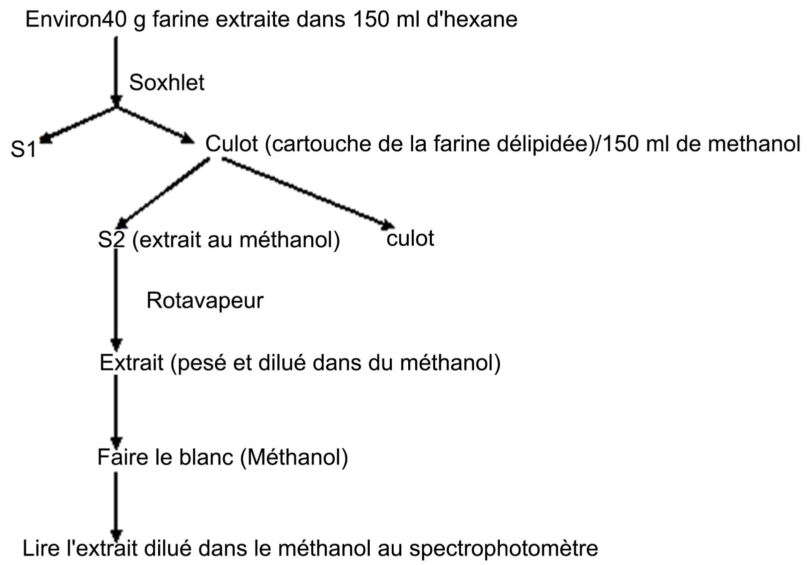
Procedure: According to the AOAC method the analysis must be carried out in duplicate.

Precision: the lipid level is given with an accuracy of 0.1%.

Calculation: as a percentage of lipid per 100 g of product.

% lipid = Weight after extraction − weight of empty capsule × 100 Weight of sample.

Quality control: carry out a vacuum extraction with hexane (new cartridge).



2.6. Microbiological Analysis

➢ **Microorganisms sought in foods after conservation**

Three types of microorganisms are conventionally sought during the microbiological analysis of foodstuffs. These are microorganisms responsible for spoilage, microorganisms indicative of fecal contamination and pathogenic microorganisms responsible for food poisoning [6]. The microbiological analyzes concerned 15 okra samples taken from 3 localities in the city of Bangui and the surrounding area.

➢ **Thinners**

The diluents are prepared by diluting 4.75 g of the powder (buffered peptone water) in 0.5 l of distilled water. The solution is homogenized and the pH adjusted to 7 ± 0.2. Then 4.5 ml of the solution is distributed into beakers. 100 ml of solution are distributed into the bottles used for repairing the stock solutions. The beakers and bottles are sterilized in the autoclave (121˚C) for 15 minutes. Beakers and flasks are removed and cooled before use.

➢ **Counting or enumeration of germs**

The enumeration of microorganisms was carried out only on solid media. It was done following the steps below.

- **Preparation of stock solutions and decimal dilutions**

The stock suspension was prepared by weighing 5 g of sample into a sterile storage bag to which 45 ml of sterile peptone water was added. From this mother suspension a series of successive decimal dilutions is carried out: 1 ml of solution is taken using a micropipette and introduced into a beaker containing 9 ml of diluent (sterile peptone water) at room temperature. 1 ml of this mixture is again taken from this last solution and introduced into the next beaker containing the same quantity of peptone water. The dilution is thus made up to the highest desired dilution.

- **Seeding**

Seeding was done using the mass inoculation method. 1 ml of each dilution is introduced into a sterile petri dish into which the culture medium maintained liquid at water bath temperature (45˚C ± 5˚C) is added. The petri dishes are then homogenized. The boxes are left to solidify in the refrigerator for a few seconds before incubation in the oven. All manipulation was carried out around a flame and on a bench previously well cleaned with 65% alcohol to avoid any contamination.

- **Incubation, reading and expression of results**

Incubation and counting of the number of germs were carried out according to the standards in force for each type of microorganism.

Certain techniques, which we describe as qualitative, make it possible to highlight the presence, or absence, of a defined germ without giving its number. The result is expressed by the words "Presence" or "Absence". It is necessary to homogenize to make them as liquid as possible. A fraction of this liquid (we speak of an inoculum) is then used to culture the germs likely to be present in the initial product.

For this study, the quantitative method was used, it consists of determining the presence or absence of the microorganisms contained in the preparation.

Statistical data processing and analysis

Graphical data was processed using Microsoft Office Excel 2013.

To assess the difference in variance in order to compare the water contents of dried okra, the ANOVA tool was used.

The Tukey HSD Test was used to identify which markets had significant differences in average protein content, after confirming an overall difference with ANOVA.

3. Results and Discussions

3.1. Results

Water content

Figure 1 and Table 1 present the results of the moisture content of dried okra for the three markets surveyed.

The average moisture content of dried okra in the three markets surveyed is 7.50%. The samples of dried okra obtained at the Ouango market have an average of 7.78%, followed by the samples from the Combattant market 7.55% and that of PK12 7.2%.

Protein content of dried okra

Table 2 and Figure 2 present the results of the protein content of dried okra for the three markets surveyed. The average protein content of dried okra across the three markets is 11.73%. The samples of dried okra obtained at the Combattant market have an average of 12.82%, followed by the samples from the Ouango market which is 12.03% and 10.35% for those from the PK12 market.

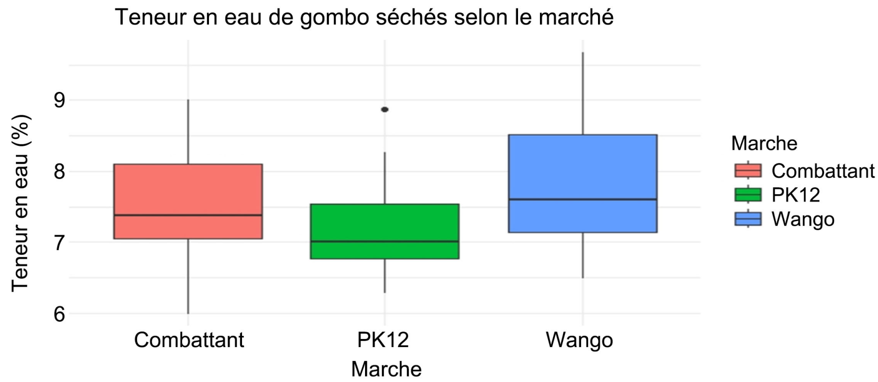


Figure 1. Moisture content of dried okra according to markets.

Table 1. Average moisture content of dried okra for the three markets.

Market	Average
Pk12	7.2
Combattant	7.52
Ouango	7.78
General average	7.50%

Table 2. Average protein content of dried okra for the three markets.

Market	Average
Pk12	10.35
Combattant	12.82
Ouango	12.03

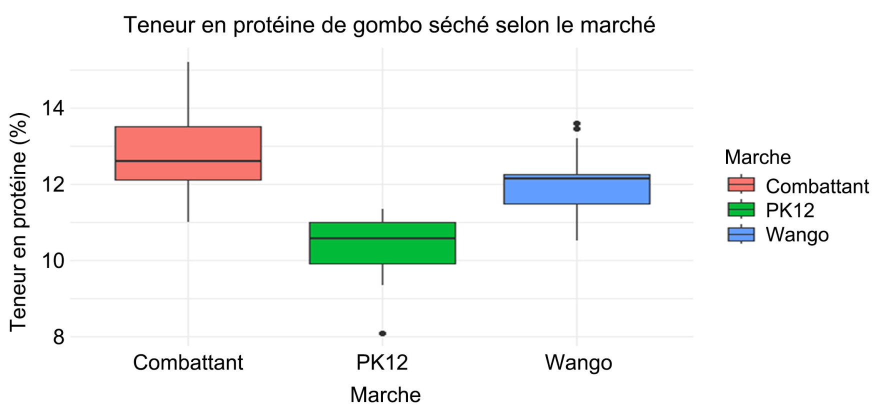


Figure 2. Protein content of dried okra according to markets.

Lipid content of dried okra

The lipid contents of the three markets are represented in Table 3 and Figure 3 with the average content of 1.50%. The dried okra samples respectively have a content of 1.60 for the Combattant market, followed by 1.48% for that of the Ouango market and a content of 1.43% for that of the PK12 market.

Table 3. Average lipid content of dried okra samples from the three markets.

Market	Average
Pk12	1.43
Combattant	1.60
Ouango	1.48

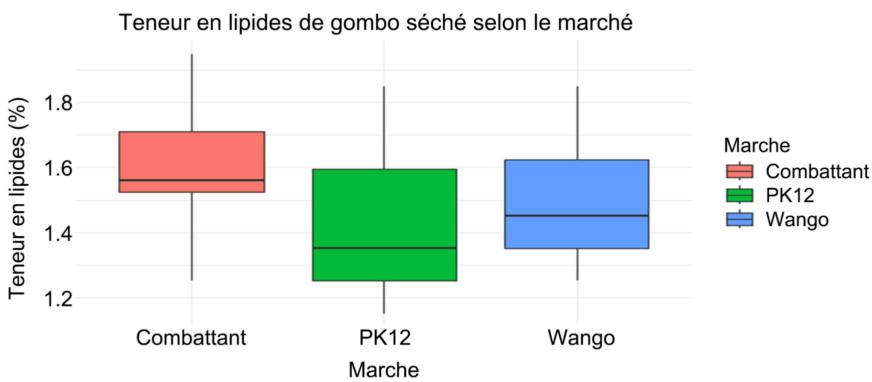


Figure 3. Lipid content of dried okra samples according to markets.

Microbiological analysis of dried okra in the three prospected markets

Okra powder samples taken from PK12 market

The microbiological analyzes carried out on the 5 samples [E1 to E5] of the batch of dried okra powder taken from the PK12 market, present the following results (Table 4):

- Absence of Salmonella spp. on medium XLD;
- Absence of Clostridium perfringens on the TSN medium;
- Presence of characteristic colonies of *Escherichia coli*, but the number of colonies obtained is lower than the standard;
- Presence of fungi characteristic of Aspergillus spp. but the number of colonies obtained is lower than the norm.

Samples of okra powder taken from the Combattant market

The microbiological analyzes carried out on the 5 samples [E1 to E5] of the batch of dried okra powder taken from the PK12 market, present the following results (Table 4):

- Absence of Salmonella spp. on medium XLD;
- Absence of Clostridium perfringens on the TSN medium;
- Presence of characteristic colonies of *Escherichia coli*, with a number of colonies obtained higher than the standard;
- Presence of fungi characteristic of Aspergillus spp. with a number of colonies obtained higher than the standard.

Samples of okra powder taken from the Ouango market

The microbiological analysis carried out on the 5 samples [E1 to E5] of the batch of dried okra powder taken from the Wango market present the following results (Table 4):

- Absence of Salmonella spp. on medium XLD;
- Absence of *Clostridium perfringens* on the TSN medium;
- Presence of characteristic colonies of *Escherichia coli*, with a number of colonies obtained higher than the standard;
- Presence of fungi characteristic of Aspergillus spp. with a number of colonies obtained higher than the standard.

Table 4. Summary of microbiological analysis results of okra in the 3 markets.

Backgrounds	PK12	Combattant	Wango	Samples
TSN	0	0	0	E1
	0	0	0	E2
	0	0	0	E3
	0	0	0	E4
	0	0	0	E5
XLD	0	0	0	E1
	0	0	0	E2
	0	0	0	E3
	0	0	0	E4
	0	0	0	E5
VRBL	6	15	*E. coli* > 100	E1
	0	24	*E. coli* > 100	E2
	0	10	*E. coli* 23	E3
	0	8	*E. coli* 78	E4
	Enterococcus faecali 12	20	*E coli* 4	E5
SAB	0	1	1	E1
	0	5	2	E2
	0	2	3	E3
	0	0	0	E4
	0	0	0	E5

3.2. Discussion

■ **Water content**

Fresh okra is characterized by a very high water content, often between 87% and 90% (Hamon and Charrier, 1997; Hamon, 1988) [7]. This is why drying is an important preservation method to reduce this humidity and extend its shelf life.

The goal of drying is to reduce the water content to a level that inhibits microbial growth and enzymatic reactions, thereby allowing long-term storage. The residual water content in dried okra directly influences its physicochemical and organoleptic properties, notably the texture and the ability to produce mucilage (the characteristic "stringiness" of okra).

For this study and in accordance with the statistical method used, it was noted that at the level of:

PK12: The median is moderate, the range of values is relatively concentrated and there is little dispersion.

Combattant: The slightly higher median, the box is narrow, therefore low dispersion. The values seem more grouped together.

Wango: The median apparently a little higher than the others. The box larger than the other two greater dispersion of contents. There can be very high values (e.g.: 9.68), but few isolated points.

Visually, Wango appears to have higher and more dispersed values. The boxplot is useful for showing trends and dispersions, but it is not enough to prove a real difference without statistical testing.

The hypothesis with ANOVA H0 (null hypothesis): the averages of the contents are equal between the three markets and H1 (alternative hypothesis): at least one average is different has shown (p-value = 0.19), these visual differences are not statistically significant.

Which leads us to say that there is no statistically significant difference between the contents of the three markets (PK12, Combattant, Wango), at the 5% threshold.

From Table 1 and Figure 1 we notice that there is no significant difference between the average water content of dried vegetables for the three markets (PK12, Combattant and Ouango) with 7.5% as the average water content. This value is close to 5% indicated for the water content of vegetables and dried fruit. However, this slight increase in the average water content of its three markets can be explained by a lack of sunshine, humidity control or the duration of drying and can be favorable to the development of microorganisms (champion, bacteria and mold).

- **Proteins**

The protein content of dried okra can vary depending on several factors, including the okra cultivar, drying method, and part of the plant used (fruit or leaves). However, the drying process tends to concentrate nutrients, including proteins, due to the removal of water.

In general, fresh okra contains around 1.9 g of protein per 100 g. When okra is dried, this content can increase significantly as a percentage of dry weight.

Comparison of the protein content of the three markets demonstrated that at the level of:

PK12 market: The median is around 10.35% (consistent with the average). The can is narrow, so the protein content is pretty consistent. The contents are generally lower than in other markets.

Combatant Market: Visibly the highest median, close to 13%. Fairly wide range of values, but the distribution is centered towards the top. Very high protein contents, this market seems the richest.

Wango Market: Median around 12%, a little less than Combattant. Moderate dispersion, fairly grouped data. Visually between PK12 and Combattant.

The boxplot visually confirms that the markets do not have the same protein content distributions. Car Combattant > Wango > PK12, in terms of average content. The difference between the medians is clear and marked. PK12 clearly stands out as having the lowest levels.

Analysis of variance (ANOVA) for the three markets PK12, Combattant and Wango shows that:

- F value = 23.85: very high, this indicates a large difference between groups compared to the internal variation.
- Pr (>F) = 1.2e−07 (*i.e.* 0.00000012): Very much less than 0.05 We rejected the null hypothesis.

Therefore, there is a statistically significant difference in protein contents between at least two markets.

The Tukey HSD test was performed to identify which markets have significant differences in average protein content, after confirming an overall difference with ANOVA.

Tukey Test Assumptions

H0 (null hypothesis): There is no significant difference in average protein content between two given markets.

H1 (alternative hypothesis): There is a significant difference in average protein content between two given markets.

- **PK12 vs Combattant**

Average difference: −2.48

p-value: 0.0000001

The protein content of PK12 is significantly different (lower here) from that of Combattant. This very low p-value (<0.001) indicates a highly significant difference.

- **Wango vs Combattant**

Average difference: −0.79

p-value: 0.0923

No significant difference between Wango and Combattant. The p-value is greater than 0.05, so we do not reject the null hypothesis.

- **Wango vs PK12**

Average difference: +1.69

p-value: 0.0001

The protein content of Wango is significantly higher than that of PK12. This p-value being very low, the difference is statistically significant.

In conclusion, the PK12 market is significantly different from the two other markets Wango and Combattant which do not present any significant difference.

The protein content of the wango and combatant market is close to the protein value reported by the study by Bêché, E. (2002) which can go up to 12.4% for certain cultivars.

This difference in the protein content of the PK12 market samples can be explained by a lower drying time than that of the Wango market and fighter or the water content is high.

- **Lipids**

The lipid content of dried okra varies, but it is generally considered a low-fat food.

The results obtained for its three markets show that:

PK12 Market: The median appears to be around 1.43%, which is relatively low compared to other markets. The box is quite narrow, indicating low variability in the data. The range of the whiskers is relatively short, so the extreme values are not far from the central values. There are no outliers (points outside the whiskers).

Combatant Market: The median is higher (around 1.60%), which suggests that the lipid content is slightly higher in this market. The dispersion of the data is wider: the box is wider and the whiskers are longer, which shows greater variability in lipid contents. There are a few isolated dots in the upper part, indicating higher values.

Wango Market: The median is around 1.48%, which places Wango between PK12 and Combattant in terms of lipid content. The dispersion seems lower than for Combattant, with a fairly centered box. The whiskers are also relatively short, but a few outliers are present, showing moderate variability.

In conclusion, Market PK12 has the lowest lipid contents, with low variability. Fighting at the highest levels, but also greater variability (wider range and more extreme values). Wango is intermediate, with lipid contents closer to those of PK12, but with moderate variability.

Analysis of variance (ANOVA) with H0 (null hypothesis): the means of lipid contents are equal between the three markets and H1 (alternative hypothesis): at least one of the means is different shows that:

- $F = 2.572$: This shows that there is some variation between groups (markets), but this variation is not extremely high compared to the internal variation (residuals).
- $p = 0.0883$: This is slightly above the significance level of 0.05. This means that we do not have enough evidence to reject the null hypothesis.

Visually we observe differences in the boxplot, statistical tests do not show a significant difference between markets for the lipid content of dried okra at a classic threshold of 5%.

This leads us to affirm that there is no statistically significant difference between the lipid contents of the three markets.

The results obtained are similar to the results of the study by (FAO/INFOODS Food Composition Table for Western Africa): Which indicates a content of 1.7 g of total lipids per 100 g of dried okra fruit. This value is higher than fresh okra due to the concentration of nutrients after drying, but is still relatively low compared to other foods.

Other studies on dried okra powder show slightly different values, for example 2.3 g per 100 g (African Shop Online). And from 4.34% to 4.52% on a dry weight basis for the study Evaluation of Fatty Acid and Amino Acid Compositions in Okra (*Abelmoschus esculentus*) Grown in Different Geographical Locations—PMC).

It is important to note that the exact content may vary depending on several factors:

- The okra variety.
- Cultivation conditions.
- The drying mode (temperature, humidity, etc.).
- The part of the okra used (fruit, leaves, etc.).
- The method of analysis.

Microorganisms

Various drying techniques have emerged. Sun drying has largely developed in arid or semi-arid areas which have optimal climatic conditions: a dry season with lots of sunshine, low rainfall, low humidity. Drying is carried out on the ground, on mats, on flat rocks, or on the roofs of houses. This system presents many advantages for families: little work, no investment.

But very often the results obtained are mediocre because the products are loaded with sand and dust.

They are attacked by animals, insects and micro-organisms. The losses are significant. In addition, products become damaged and dry too much or not enough, which significantly degrades quality [8] [9]:

For this study, the analysis took into account the presence or absence (qualitative aspect) of coliforms, fungi and/or molds (aspergillus) and saprophytic germs. Our work does not allow us to say whether the samples remain acceptable or not since the determination of CFU was not carried out to quantify the microorganisms.

According to Rioux (1995) vegetables, once dried, should not contain more than 4% to 5% water.

The results obtained on the VRBL and SAB medium of the Wango and Combatant samples may come from the exposure of its products to the open air during drying either by poor conditioning after drying or by a long shelf life given the high water content.

4. Conclusion and Perspective

The traditional method of handling and drying okra by producers and traders in Bangui is not very conclusive given the lack of control of physicochemical parameters (temperature and humidity) with an average humidity level of 7.50% higher than the standard of 5%. This explains the contamination of certain samples by microorganisms.

Traditional sun drying therefore uses a combination of variable exposure to the sun and hot, relatively dry air (50%) as well as physical efforts to spread, mix, protect and bag the foodstuffs. Whatever the product to be dried, there are many manipulations and it is a long process.

According to the interviews and descriptions of diagram 1 of drying by the traders and producers of its three markets

Traditional drying has many advantages:

- it does not require industrial energy because the sun's energy is free;
- it does not require very expensive tools or equipment;
- ancestral techniques are well mastered and are part of the users' culture;

But it also has many disadvantages:

- possibility of residual humidity causing mold;
- frequent presence of dust and foreign elements;
- insect infestation;
- samples taken by rodents;
- microbiological quality often doubtful;
- short shelf life leading to rapid alteration of the appearance and taste of the product;
- very "time-consuming" process for producers [10]-[12].

For all these reasons, traditional drying, while remaining within the framework of tradition, must undergo simple improvements because the majority of local populations do not have the financial means to obtain complicated and expensive equipment, but small changes could remedy a large number of the disadvantages described above and improve yield, sometimes spectacularly as shown in the case of the yam chip described in the interview "Improved traditional drying.

This is actually a very simple improvement:

- cutting into smaller pieces than those to which the population has always been accustomed, which makes it possible to reduce the time spent on drying.
- choose drying surfaces facing the sun.
- build drying surfaces in a location well exposed to the wind: the food will dry there more quickly;
- paint the drying surfaces black: this color retains heat and the surfaces will transmit more heat to the food;
- provide twice the required surface: each time the grains are mixed, they will be moved to the section which has in the meantime been heated by the sun. Thus more heat will migrate by conduction from the drying surface towards the interior of the grains;
- if using the rack, cover the drying racks with black sheet metal: air enters from below the rack.
- The sheet metal exposed to the blazing sun becomes very hot and by conduction this heat is transmitted to the column of air under the sheet metal. This column of air then transmits heat to the foodstuffs which return it in exchange for water vapor. Slowly the humid air will escape through the hole in the sheet metal which acts à bit like a chimney. The excess heat obtained by this system will allow fruit and vegetable bananas, coconut palms, hot peppers and tomatoes to be dried without them blackening and losing too many vitamins in contact with ultraviolet radiation;
- use plastic-coated windows: in a rectangular enclosure closed on all sides, par-

tially open at the base and covered with plastic-coated windows, solar radiation passes through the transparent plastic and is absorbed by the interior surfaces and the food. Some of this solar radiation is reflected but cannot escape directly through the transparent plastic. As solar radiation enters the dryer, the heat increases and the food dries faster.

Finally, to remedy one of the major defects of traditional drying, namely frequent microbial contamination, simple improvements can be made without any cost:

- wash your hands thoroughly with drinking water and soap before handling food;
- clean cutting equipment and utensils thoroughly before each drying session;
- wash the food thoroughly with a brush and water not contaminated by chemical substances and previously boiled for 20 minutes;
- wash the drying racks before each drying session;
- package dried foods in very dry containers, previously cleaned with boiling, soapy drinking water, and close the containers tightly.

In addition to its advice illustrated by the chapter Improved traditional drying of the CTA book Drying of agricultural products, it is therefore important to raise awareness and train the population on good practices and the advantage of simple improved solar drying.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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