Evaluation of the quality of vegetables and fruits marketed at the level of the Kenitra city

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***Abstract*-**The objective of this work is to assess the quality of fruits and vegetables in the Kenitra city, in order to ensure healthy nutrition. All of this work was carried out at the level of the Laboratory of Natural Resources and Sustainable Development, from April the first until the end of July. In water, the pH and acidity at the level of the laboratory by which we obtained our results, Most of these foods are acidic with a pH between 2.76 -6.9 and an acidity between 0.5 and 4, 02 g / l. And from these results we observe when the hydrogen potential increases the acidity is decreased. Regarding water activity of these foods allowing to notice that the temperature decreases when increasing temperature or vice versa.

***Index Terms*-** Acidity, Fruits, Vegetables, Content, Nutrition, temperature.

I. INTRODUCTION

THe Moroccan diet, Mediterranean type, is based on a large consumption of cereals, fruits and vegetables. [1].
Public health policies encourage the consumption of more fruits and vegetables, and much work has been done on their emergence and implementation [2].
Fruits and vegetables constitute an object little studied by sociology [3].
Accurate measurement of fruit and vegetable consumption is essential for developing meaningful health messages [4]
The Country Nutrition Profiles provides concise summaries on the food and nutrition situation of countries, also including basic statistics on food-related factors such as agricultural production, as well as relevant health, economic and demographic indicators [1].

Food influences the absorption of many drugs. It can decrease or increase it and even delay it. Thus, the change in stomach acidity plays an important role in drug absorption [5]. After a meal the acidity increases, so some drugs are less absorbed [6].

The water contents of several vegetables have been the subject of several studies. Thus, Cotte in 2000 showed that the tomato has about 95% water [7]. Other information exists such as the case of the Phytomania site which reports the water content of some medicinal crops such as chilli (8%), eggplant (92%) and onion (90%) [8].

Vegetables on the occurrence of clinical studies measure the effects of fruit and vegetable consumption on cardiovascular risk factors, and pharmacological intervention trials measure the impact of major compounds in fruits and vegetables on the occurrence of vascular events [9].

Certain foods consumed have beneficial effects in humans; especially the consumption of a particular fruit or vegetable cannot be reduced to the effect of only one substance [10].

The objective of this work is to assess the quality of fruits and vegetables in the city of Kenitra, in order to ensure healthy nutrition.

II.MATERIAL AND METHODS

All of this work was carried out at the Agrophysiology, Biotechnology, Environment and Quality Laboratory (LABEQ) of the Biology Department Ibn Tofail University of Sciences for four months (from April 1 to the end of July).

The fruits and vegetables studied come from the public market in the city of Kenitra-Morocco. The sample either has been crushed by grinding in the form of a juice or they have been reduced to powder, the material is harvested at full maturity, washed and cleaned then packaged in food bags and placed in the refrigerator (4 ° C).) for the duration of the tests.

The Products and chemical reagents used in this work are Distilled Water, 0.1N sodium hydroxide (NaOH) solution and Phenolphthalein. As Apparatus, we worked with a bench-top precision analytical balance, pH meter, muffle furnace, bain-marie and oven.

We determine the water content, pH and acidity of certain foods most consumed by the target population.

Physico-chemical analyzes

1. Determination of water content [11].

The principle is based on the loss of free water from the sample during steaming. First dry the empty capsules in an oven for 15 min at a T ° of 103 ° C. We tare the capsules after cooling in a desiccator. After that, 3 g of samples were weighed into each capsule and placed in the oven set at 103 ° C for three hours. The capsules are removed from the oven, placed in the desiccator and after cooling, they are weighed. The operation is repeated until a constant weight is obtained (reducing the drying time to 30 minutes) to avoid caramelization.

The water content relative to the wet mass is calculated by the following formula: W mh = (mi - mf) / mi x 100 (W mh: mass, in grams, wet; mi: mass, in grams, initial; mf : mass, in grams, final).

2. Determination of the hydrogen potential (pH)

The hydrogen potential makes it possible to evaluate the concentration of the hydrogen ion in a solution. The dried sample is placed in a beaker and nine times its volume of distilled water (DE) is added. It is heated in a water bath for 30 minutes, stirring occasionally, then the mixture and ground in a mortar [12]. Then the pH meter is calibrated with a buffer solution whose pH is 7 and 4, by immersing the electrode in the sample solution and the reading is taken directly on the pH meter.

3. Determination of titratable acidity [13].

Principle of dosage

This measurement is carried out by neutralizing the total free acidity with a deci normal sodium hydroxide solution (0.1N). The progress of the neutralization is followed using a pH meter and a colored reagent (phenol phthalein). The assay is stopped when the pH reaches 8.2 (endpoint of the phenol phthalein from colorless to orange-pink).

Operating mode

- Take 30 ml of apple juice in a beaker, Pour 3 or 4 drops of phenol phthalein in the juice, then place the electrode of the pH meter in the juice, so that the head and the port of the electrode are covered. at the same time pour the sodium hydroxide solution drop by drop until pH 8.2 is reached.

From the volume of 0.1N soda used for neutralization, we can determine the total acidity of the juice, as well as the acidity of the juice of the sample in g / we multiply the volume of soda poured (previously divided by 3) by the coefficient 0.67.

And at the end of the same previous principles, we measured the pH and acidity of some fruit and vegetable salads. We chose the most consumed by the population of the city of kénitra.

III.RESULTS AND DISCUSSION

We carried out analyzes for the water content, the pH and the acidity of the foods most consumed by the population of the city of Kénitra-Morocco, these analyzes are done at the level of LABEQ by which we have drawn these graphs which allowed us to shed some light on what we eat as fruits and vegetables. The relevant results of our work are noted below.

1. Determination of water content

In our study, we measured the water content of certain fruits and vegetables the most consumed by the population of the city of Kénitra. From table 1 it has been observed that there is a little deference between the percentages of the water content of all foods, such that the highest value is lettuce with a percentage of 96.5 and the lower was the apricot with a percentage of 75.2. For a water activity of these foods making it possible to notice that the temperature decreases when increasing the temperature or vice versa table 1 and table 2.

Table 1: The water content of some vegetables

Samples	**Water Content (%)**
Onion	88,5
tomato	95
carrot	88,5
Cucumber	96
Pepper	89,8
Lettuce	96,5
Green bean	87,1
Turnip	92,2
Potato	78,2
Radish	92,5
Beet	85,9
Craftsman	84,3

Table 2: The water content of some fruits

Echantillons	Teneur en eau (%)
Nectarine	86,39
Sin	86,04
Pastic	90,06
Apricot	75,2
Mellon	90,5
grappes	79,5
Pear	84,05
Apple	83,7
Banana	74,2
Pine apple	85,2
Papaya	87,8
Mango	81 ,05
Figs	77,3
Orange	83,1
Plum	86,07
Lemon	88,6
strawberry	90,2

1. *Determination the hydrogen potential (pH) and the Acidity (A)*

Table 3: pH measurement of some fruits and vegetables

Aliments	PH	Acidity
Onion	6,2	1,005
Tomato	5	1,14
carrots	6	0,87
Cucumbr	6	0,94
Fegus	6,5	0,67
Pepper	6,8	0,6
Lettuce	6	0,9
Green bean	6,9	0,9
Parsely	6,5	0,74
Pastic	5	1,07
Nectarine	4,2	3,68
Sin	3,5	4,55
Potato	6,5	0,75
Turnip	6,2	1,005
Apricot	3,7	3,95
Mellon	6	0,87
grappes	4	4,02
Coriander	6,9	0,5
Radish	6,3	0,88
Cramp	6,2	1,072
Beet	4,9	1,2
Pear	6	0,87
Apple	4	4,15
Banana	6,5	0,67
Pinneapple	3,6	3,88
Papaya	5,3	1,005
Mango	4,2	3,68
Craftsman	5,25	1,03
Figs	4,5	3,21
Oranges	3,78	3,84
Eggplant	4,9	1,25
Plum	3,6	4,02

From these results it was observed that almost all the foods analyzed are acidic, its pH values are between 2.76 and 6.9 (Table 3). The pH varies depending on the maturity and variety of the fruit. The more ripe a food, the higher its pH. These results are in agreement with those found by the study by Gregory Salomon MONROSE, 2009 "Standardization of a formulation of chadèque jam and evaluation of physicochemical, microbiological and sensory "[14].Microbes grow very little at a pH below 4, Natural chemical reactions are limited in very acidic pH[14].

Table 3 presents as the results obtained concerning the acidity; from this study it is observed that the foods are acidic with acidity values between 0.5 and 4.02 g / l. In the same sense it is deduced that the titratable acidity of vegetables and fruit varies very little from one treatment to Acidity helps to bring out the taste of the food too much acidity gives a pungent taste in the mouth [14]. The study of Biochemical dosage of phenolic compounds in dates and honey harvested in southern Algeria also found acidic dates by Ahmed Bessas and deduced that high acidity is often associated with poor quality [15].

IV.CONCLUSION

According to this study, it is found that when the pH increases the acidity is decreased. The values of acidity, pH and water content may vary from region to region, depending on the physiological state of fruits and vegetables, climatic conditions, and cultivation methods. The pH of most vegetables and some fruits favors the growth of food bacteria, the pH of most vegetables and some fruits favor the growth of food bacteria. The pH of most vegetables and some fruits promotes the growth of food bacteria that can be toxic to our health study [17].

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