

# Should bread be targeted as a vector to reduce sodium intake in Morocco?

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## Abstract

**Background:** High blood pressure is a serious public health problem in Morocco; the national survey of cardiovascular risk factors in Morocco found a prevalence of 33.6% of people with high blood pressure (HBP) with a higher prevalence among women, also, the World Health Organization estimated the prevalence of HBP in 2008 at 41.2%.

Our study aimed to evaluate the amount of salt provided by the consumption of bread, since it is a staple food, in daily food intake and compare it to the recommendations. This study aims to raise awareness about salt consumption and its impact in causing high blood pressure.

**Methods:** We used the MOHR method to quantify sodium in bread samples from 80 professional bakeries in Casablanca.

**Results:** Results showed that the average amount of salt used in the preparation of bread is  $17.42 \pm 1.28$  g / kg, which is the equivalent of a daily intake of 8 to 9 g of salt through bread alone, and exceeds all recommendations.

**Conclusion:** We can only recommend using it as a vector for the programme of awareness about salt over-consumption and its impact on raising the prevalence of hypertension.

## Introduction

High blood pressure (HBP) is a serious public health problem in Morocco; the national survey of cardiovascular risk factors in Morocco found a prevalence of 33.6% of people with HBP with a higher prevalence among women (Tazi et al., 2001), also, the World Health Organization estimated the prevalence of HBP in 2008 at 41.2% (World Health Organization, 2011). Nowadays, evidence shows that high levels of sodium consumption lead to hypertension, heart attacks and strokes (Ness, 2009). In many population-based studies around the world, as salt intake rises, so does blood pressure (Ness, 2009).

In Morocco, there are no indicators about the population's sodium intake, but, since bread is the staple food in every Moroccan household, we aimed to evaluate the amount of salt provided by the consumption of bread in daily food intake and compare it to the recommendations. This study aims to raise awareness about salt consumption and its impact in causing high blood pressure.

We used the MOHR method to quantify sodium in bread samples from 80 bakeries in Casablanca; from each bakery we took samples from regular bread (baked with salt) and samples from diet bread (baked without adding salt). Since NaCl is not the only source of  $\text{Cl}^-$  that can be found in bread, we used the diet bread as control since it has the same ingredients as the regular bread except for the added salt. Thus, the difference in extra amount of  $\text{Cl}^-$  found in regular bread would be correspondent to the amount of NaCl used in it.

We took 5 g of bread from each sample, and added it to 40 mL of  $\text{H}_2\text{O}$  to extract the sodium in each bread sample. The solution is then filtered and 10 mL were taken for the titration, to which we added 10 drops of Potassium chromate  $\text{K}_2\text{CrO}_4$  ( $0.05 \text{ mol.L}^{-1}$ ). The titration is done using a solution of Silver nitrate  $\text{AgNO}_3$  ( $0.05 \text{ mol.L}^{-1}$ ) until the white precipitate turns red. A calibration range is prepared using known concentrations of sodium.

Results showed that the average amount of salt used in the preparation of bread is  $17.42 \pm 1.28 \text{ g / kg}$ . Most bakeries use between 15 and 20 g/Kg of salt in their bread, while the others use between 10 and 15 g/Kg. In Morocco, the daily individual

average of bread consumption is about 500 g (Mokhtar et al., 2001) which is the equivalent of a daily intake of 8 to 9 g of salt through bread alone.

## **International recommendations**

These values exceed both reference values indicated by the Institute of Medicine (IOM), United States in 2004; IOM established the sufficient daily intake at 1500 mg of sodium (3.75 g of salt) for people between 9 and 50 years old, and lower quantities for other ages. Also the IOM established the maximal tolerated value of sodium at 2300 mg (7.75 g of salt) for individuals of over 14 years old, and lower quantities for younger people.

Also, in 2003, the World Health Organization set the therapeutic target of daily sodium consumption at 2000 mg (5 g of salt).

We can only notice that the average sodium intake of sodium through bread alone exceeds all these recommendations, by at least 50%. However, the situation isn't desperate, several countries have implemented strategies to reduce sodium intake (Ness, 2009), either by encouraging manufacturers to reduce added sodium, or by implementing a labeling system. These measures and policies contributed to decreasing overall blood pressure and reducing heart attacks and strokes in the targeted populations (Ness, 2009). Indeed, lowering blood pressure in the population, even by small amounts, is likely to have a large benefit in preventing heart attacks and strokes (Ness, 2009).

Thus, in the absence of data about the exact salt intake in Morocco, we can only recommend using these data about bread to raise awareness about salt over-consumption and its impact on raising the prevalence of hypertension. Salt intake through bread consumption only exceeds the WHO recommendations, which means that lowering salt in bread should only be the first step and not be counteracted by people increasing added salt into their meals, that is why awareness campaigns should focus on that matter, and we should also focus on the population's acceptance of low-salt bread to see how much of an impact this action might have.

## **Acknowledgments**

100 The authors acknowledge the efforts and the help of Mr. Lahoussine AZAZ, president  
101 of the Fédération Nationale de la Boulangerie et Pâtisserie du Maroc.

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