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Research Article

# Analyses of Some Technological Characteristics of Six Blends of Four Varieties: HD 1220 (HIDHAB), ARZ, MAHONX DEMIAS and ANZA of Wheat in Constantine

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## Abstract

For geneticists and breeders, the force is a varietal characteristic. For the processing and use industries, the strength of wheat and flour is a technological feature that determines the quality of finished products. However, we try to define some characters related to technology the 8 mixtures of 4 varieties: HD1220, ARZ, MAHON X DEMIAS and ANZA. Flours: M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) are very low with respect to the standard required by the bakery. On the other hands, M1 (ANZA + HD1220), M2 (ANZA + MXD) and M3 (ANZA + ARZ) have good baking strength. We cannot rely only on this test for a proper assessment of the baking strength of the flour as it is influenced by the conditions of plant development. Other tests for assessing these properties are required; the most important is the Alveograph CHOPIN. All meals: M1, M2, M3, M4, M5 and M6 are very rich in gluten so, all these flours are wheat force. The dough: M6 is little resistant and moderately extensible. That of M6 is bread flour while M1 and M5 is bakery. It is further, M2 and M3 are force flour while M4 is a less resistant and low stretch dough.

**Keywords:** HD 1220; ARZ; MAHON X DEMIAS; ANZA; six mixtures: M1, M2, M3, M4, M5 and M6

## Introduction

The search farmer productive varieties adapted to the area and able to give an important specific weight. The miller is looking for suitable wheat to give a high yield of flour. Therefore, we tried to study the Zeleny index, dry gluten and wet gluten, 6 mixtures configuration softening and the report: M1 (ANZA + HD 1220), M2 (ANZA + MXD), M3 (ANZA + ARZ), M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) of wheat.

## Material and methods

**Protein determination by the method of KDJELDAHL (g / 100 g M.S.)**

Calculating the content of proteins is obtained by multiplying the nitrogen content by 6.25 which is the nitrogen conversion factor protein. P (%) = N (%) x 6.25.

**Zeleny test or sedimentation index (mg)**

The sedimentation volume formed is expressed in milligrams per reading on the cylinder (J.L. KIGGER and J.C. KIGGER, 1967).

| | | | |
|---|---|---|---|
| Less than 18 | Between 18 and 28 | Between 28 and 38 | Greater than 38 |
| Insufficient | Happy baking strength | Very good baking strength | cover wheat |

**Determination of gluten (%)**

- According to LE COQ (1965), the dry gluten content is 8 to 12% for soft wheat flours.
- Flour called exotic wheat hard wheat has a dry gluten content of between 12-15% (CALVEL 1984).
- According DELACHAUX (1983), the standard for the wet gluten content is 27.85%.

**Softening (mm)**

According KRANZ and Kozmin (1966), the softening is as follows:

| | |
|---|---|
| Softening less than 2 mm | Gluten tenacious, very difficult to farm development during fermentation |
| Softening of 2 to 4 mm | Gluten good quality |
| Softening of 4 to 8 mm | Average quality gluten |
| Softening 8-13 mm | Gluten poor |

**Configuration Report: P / L**

It gives an indication between tenacity and extensibility of the dough (BAR, 1995).

The use of the flour according to the configuration report: P/L (CHRISTIAN, 2000) is:

| Use to | Value P / L |
|---|---|
| Flour for making bread | 0.50 à 0.80 |
| Shortly paste Moderately Resistant and Extensible | 0.50 |
| Very Resistant and paste Moderately Extensible | 1.50 |

**Swell Index: G (cm3)**

- Use to value P / L
- Flour for making bread 0.50 0.80
- Shortly paste Moderately Resistant and Extensible 0.50
- Very Resistant and paste Moderately Extensible 1.50

**Swelling index: G (cm3)**

Swelling is the same magnitude as the length of the curve L and connected according BAR (1995) by: $G = \sqrt{2.22}$ L. Good swelling 20-30, 33¬Pate Ameliorative.

## Results and Discussion

### Proteins rate (%)

The protein level is an important criterion of quality. Indeed, the quantity and quality of protein occupies the largest share in the bread making (MAUZE 1972). All meals: M1, M2, M3, M4, M5 and M6 are in the recommended standards

### Zeleny test or sedimentation index (mg)

Flours: M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) are very low with respect to the standard required by the bakery. By cons, M1 (ANZA + HD1220), M2 (ANZA + MXD) and M3 (ANZA + ARZ) have good baking strength.

We cannot rely only on this test for a proper assessment of the baking strength of the flour as it is influenced by the conditions of plant development. Other tests for assessing these properties are required; the most important is the Alveograph CHOPIN.

### Dry gluten (%)

All meals: M1 (ANZA + HD 1220), M2 (ANZA + MXD), M3 (ANZA + ARZ), M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) are very rich in gluten. All these flours are wheat force.

### Wet gluten (%)

All meals: M1 (ANZA + HD 1220), M2 (ANZA + MXD), M3 (ANZA + ARZ), M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) are very rich in gluten. All these flours are wheat force. The high content of flour could be due to a high water absorption because gluten is more good more it absorbs water and is a great difference between the weight of wet and dry gluten.

### Softening

- Flours: M1 (ANZA + HD 1220) is a good quality gluten.
- Flour: M4 (MXD + HD 1220) has a tenacious gluten, firm and very difficult development during fermentation.
- Flours: M2 (ANZA + MXD), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) have average quality glutens.
- Flour: M3 (ANZA + ARZ) has a poor-quality gluten (SOUFI et al, 2009.).

### Configuration Report or P / L

The dough: M6 (ARZ + HD 1220) is very resistant and mod-

erately extensible. M6 (ARZ + HD 1220) is a bread flour while M1 (ANZA + HD 1220) and M5 (MXD + ARZ) are bakery. M2 (ANZA + MXD) and M3 (ANZA + ARZ) are force flour while M4 (MXD + HD 1220) is a less resistant and low stretch dough.

### Swelling index or G

**Pasta:** M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) has a good swelling. While the pasta: M1 (ANZA + HD 1220), M2 (ANZA + MXD) and M3 (ANZA + ARZ) have a small swelling.

## Conclusion

The work we have undertaken is to study some technological features eight blends M1 (ANZA + HD1220), M2 (ANZA + MXD), M3 (ANZA + ARZ), M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) in four varieties: HD 1220, ARZ, MAHON X DEMIAS and ANZA.

**Analysis of the test results show that:**

**All meals:** M1, M2, M3, M4, M5 and M6 are in the standards recommended for protein levels.

Flours: M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) are very low with respect to the standard required by the bakery. By cons, M1 (ANZA + HD1220), M2 (ANZA + MXD) and M3 (ANZA + ARZ) have good baking strength.

We cannot rely only on this test for a proper assessment of the baking strength of the flour as it is influenced by the conditions of plant development.

**All meals:** M1 (ANZA + HD 1220), M2 (ANZA + MXD), M3 (ANZA + ARZ), M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) are very rich in gluten. All these flours are wheat force.

**Pasta:** M4 (MXD + HD 1220), M5 (MXD + ARZ) and M6 (ARZ + HD 1220) has a good swelling. While the pasta: M1 (ANZA + HD 1220), M2 (ANZA + MXD) and M3 (ANZA + ARZ) have a small swelling. Other tests performed on four varieties of which would be beneficial to establish their genetic variability.

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