

Hardness Level

The level of hardness is related to crispness, which is whether it easy or not for the dry bread to be broken.

Table 10. Hardness Level

Treatment (%)	Average of dry bread hardness level (g force)
0	2803,01
12,5	6043,26

In the fortification of red tilapia bone flour of 12.5%, the hardness value is 6043.26 gf, which means that it is harder than the treatment without the addition of red tilapia flour, which is 2803.01 gf. The greater the average value of hardness means that dry bread is less easily destroyed (harder). In accordance with Nurafifah's statement (2015), the addition of the dry bone flour makes the product harder. The results of the research by Syadeto et al. (2017) showed an increase in the hardness value resulting from each increase in the treatment of adding red tilapia bone flour to the product. The level of hardness of dry bread added with bone flour will be higher due to the anti-elastic reaction (elastic properties of gluten decreases). The addition of bone flour results in the binding of OH particles which are part of the water element (H₂O) so that the amount of water decreases and the gluten elasticity decreases. Gluten plays an important role as a building material for dough structures (Maulida 2005).

CONCLUSION

The result of the study of the panelists' preference for appearance, aroma, texture, and taste of dry bread shows that the dry breads in the treatment of fortification up to 15% are still preferred. The treatment of adding red tilapia bone flour of 12.5% is preferred compared to other treatments based on Bayes test. It has a higher alternative value of 7.52 with calcium levels of 1.614%, 3.1% moisture content, volume expansion rate of 39.8%, and violence of 6043.26 gf. Based on the hedonic test, the average value of appearance is 5.3, the aroma is 7.4, the texture is 7.9, and the flavor is 7.6.

SUGGESTION

Based on the results of the study several things can be suggested, including:

1. To get the preferred dry bread with the addition of red tilapia bone flour as a source of calcium, it is better to use the 12.5% red tilapia bone fortification.
2. It is necessary to conduct a research on the shelf life of red tilapia bone flour as well as dry bread with the addition of bone flour.
3. It is necessary to apply the addition of red tilapia bone flour to other forms of products such as other bakery products.

References

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