Global Scientific JOURNALS

GSJ: Volume 9, Issue 12, December 2021, Online: ISSN 2320-9186
www.globalscientificjournal.com

ARTICLE RIVIEW ANALYSIS OF WATER CONTENT OF PROCESSED FISHERY PRODUCTS ON ALUMINUM FOIL PACKAGING

Saiful bin Taking1 and Junianto2

ABSTRACT

Fish is a very important source of animal protein. Therefore, efforts are needed to increase the shelf life of fishery products. Fishery products are products that are very quickly damaged and if not immediately taken action preservation. Aluminium foil is a type of packaging that is produced using aluminium foil or alufoil as the basic material. In general, this packaging is used for products that need to be protected from sunlight and powder products that clump. The method used in this journal is a laboratory test method by analysis the water content of a processed fishery product packaged in aluminium foil. The purpose of this journal is to determine the water content of fishery products. In addition, this journal also aims to determine the effect of the type of aluminium foil packaging on the quality of fishery products.

Keywords : Processed Fish, Aluminium Foil Packaging, Water Content

PRELIMINARY

Fish is an animal food that has high nutritional content such as protein, fat, minerals and vitamins that are needed by humans. Indonesian people consume a lot of fish products because they are widespread in Indonesian waters. However, fish is also classified as food that is easily damaged and quickly decays. Prevention efforts to overcome the decay process can be done by means of preservation and processing using various methods as needed. Food packaging is a way to prevent contamination from the external environment of the product.

In general, packaging is an object that is used as a container or place and can provide protection according to its purpose. The existence of packaging can help prevent/reduce damage, protect the materials in it from contamination and physical disturbances such as friction, impact, and vibration. Packaging also aims to increase the attractiveness of consumers/buyers (Syarief, 1989).

According to Winarno and Betty (1983) in (Nur, 2009) food damage can be caused by two things, namely damage by the natural nature of the product which takes place spontaneously; and the second is damage due to environmental influences. With packaging, environmental influences that can accelerate the process of food damage can be prevented, inhibited or delayed for a certain time as needed.

Flexible packaging is a form of flexible packaging that is formed from aluminium foil, plastic film, cellophane, plastic film coated with aluminium metal (metalized film) and paper made in one or more layers with or without thermoplastic or other adhesive materials as a binder or construction coating. Packaging can be in the form of sheets, bags, sachets or other forms (Ministry of Industry, 2007).

Aluminium foil is a packaging material in the form of a dense and thin sheet of aluminium metal with a thickness of <0.15 mm. This packaging has a hardness level from 0 which is very soft, to H-n which means hard. The higher the H- number, the harder the aluminium foil. The thickness of the aluminium foil determines its protective properties. If it is not thick enough, then the foil can be passed by gas and steam. At a thickness of 0.0375 mm, the permeability to water vapor = 0, meaning that the foil cannot be passed by water vapor (Julianti, 2007).

Aluminium foil has hermatic properties, is flexible, and is not affected by light, so it can be used to pack fatty and light-sensitive materials such as margarine, yogurt, etc. (Julianti, 2007).

Packaging with aluminium foil has a low permeability to moisture and water. Paine (1969) Nagi et al (2012) also stated that aluminium foil has a lower water absorption capacity compared to polyethylene so that it can protect against moisture and air containing water vapor. Changes in water content in aluminium foil are low because the water vapor transmission value is also the lowest so that aluminium foil packaging has better water protection properties than polyethylene (Bagem, 2012).

DISCUSSION AND RESULTS

Water has an important role in food, which plays a role in influencing the freshness, stability, and durability of food, as a solvent for polar and ionic compounds, plays a role in chemical reactions, enzyme activity, microbial growth, determines the level of food safety risk, and as a heat transfer medium (Kusnadar 2010).

Measurement of water content in a food product is very important. High or low water content in foodstuffs greatly affects the quality of these products.

Moisture content is one of the common and important parameters which is required in the quality standard of a food, because the water content in the food ingredients greatly determines the possibility of biochemical reactions (Buckle et al., 1987). According to the Indonesian National Standard, the water content of a fishery product ranges from 4-12%.

In addition, the increase in water content during storage is carried out due to the process of evaporation and absorption of water by the material in the surrounding environment. As explained by Winarno (2007), the water content of a product is closely related to the water activity in the food (Aw) and the Rh (relative humidity) water content around or in the environment of the food product.

Here are some journals of processed fishery products by testing the water content on aluminium foil packaging.

Research Title	Research result
THE EFFECT OF MULTIPLE PACKAGING ON THE QUALITY OF BISCUIT CONTAINING JAMBAL SIAM FISH OIL (Pangasius hypophthalmus)	The average value of moisture content in biscuits containing jambal siam fish oil with double packaging was carried out for 60 days. The average moisture content of biscuits containing jambal siam fish oil with double packaging ranged from 2.39% to 1.74%. The water content of the highest average value was in the cardboard-coated HDPE packaging, which was 2.39%, while the lowest was in the cardboard-coated Aluminium foil packaging, which was 1.74%. The moisture content of biscuits containing jambal siam oil in the cardboard-coated HDPE packaging is 1.77%, while the cardboard-coated aluminium foil is 0.99% and the longer the storage time the biscuit moisture content increases. In general, the water content in each double package showed a significant effect, this was supported by the results that the use of double packaging on the moisture content of biscuits containing jambal siam fish oil during storage at room temperature, where F_{Count} 106.29 > F_{Table} 7.71 at the 95% confidence level, the hypothesis (H_0) was rejected and further test (BNT) was carried out. In the BNT test, it was explained that the use of multiple types of packaging in the treatment of aluminium foil packaging covered with cardboard was significantly different from the treatment of HDPE packaging covered with cardboard at a 95% confidence level. The moisture content of biscuits containing jambal siam fish oil is still below the SNI standard for biscuits, namely the maximum water content is 4% (SNI 01-7111.2-2005). Based on SNI, the best water content of packaged biscuits is Aluminium foil lined with cardboard which has a moisture content of 2.47% at 60 days of observation. While the HDPE packaging covered with cardboard is 3.12%.
Determination of Water Content of Seruway Terasi in Aluminium Packaging Different Foil And Storage Temperature	This research was conducted with four temperature deviations, namely -18 ºC (freezer), 4 ºC (cooling), 28 ºC (room temperature), and 40 ºC (incubator) and observations were carried out for 40 days starting from the 10, 20th day, 30th day, to 40th day for each treatment. The water content of the aluminium foil packaging on the 10th day at -18 ºC decreased in water content compared to 4 ºC, 28 ºC, 40 ºC. On the 20th day the water content at 4 ºC with a temperature of 28 ºC decreases and for a temperature of 18 ˚C experiencing rising water levels. On the 30th day the water content at three temperatures, namely -18 ºC, 4 ºC, and 28 ºC again increased, while at 40 ºC the water content decreased from the 30th day to the 40th day. So it can be concluded that the aluminium foil packaging with the best storage temperature is at 40 ºC on the 40th day. The rate of water content at -18 ºC during storage from 10 to 40 increased faster than the temperature of 4 ºC, 28 ºC and

	40 º C. The value of b or the regression coefficient showed a positive value at -18 º C and 4 º C so that it can be said that each value of x (storage time) increases the value of y (water content). Meanwhile, temperatures of 28 º C and 40 º C showed negative values, so it can be said that the value of x (storage time) can reduce the value of y (water content). The regression coefficient (R2) at each temperature has a positive value, indicating a perfect linear relationship at the three storage temperatures, namely -18 º C (0.7815), 4 º C (0.0693), 28 º C (0.1942) and 40 º C (0.784). Of the four temperatures, one temperature that does not affect the water content of the Seruway terasi paste is at a temperature of 280C, while the other three temperatures show the relationship between storage time greatly affects the value of the water content at each storage temperature in aluminium foil packaging.
ESTIMATION OF THE EXPIRATION PERIOD OF Jerky, pulverized catfish (Pangasius hypophthalmus) ON ALUMINUM FOIL PACKING	The results of observations on the value of water content at room temperature (27 º C) and cold temperatures (5 º C) and observations were made for 49 days. The increase in the water content of catfish mashed beef jerky in aluminium foil packaging at room temperature (27 º C) on day 0 was 9.748% to 12.616% on day 49 and observations at cold temperatures (5 º C) on day 4. 0 is 8.7% to 12.121% on day 49. It is known that the relationship between the observation time and the water content of catfish jerky in aluminium foil packaging at room temperature (5 º C) is the regression equation at cold temperatures y = 0.624x + 0.588 with a coefficient of determination (R2) of 0.992 which means the water content has a close relationship where every observation will be followed by an increase in the value of the water content. Observations showed that the water content of catfish mashed jerky at room temperature (27 º C) and cold temperature (5 º C) had increased and had experienced rejection. This is in accordance with SNI 01-2908-1992 regarding the water content rejection limit for jerky products is 12%.
The Effect of Aluminium Foil and Glass Bottle Packaging on the Shelf Life of Shredded Mackerel (Euthynnus affinis) with the Arrhenius Method Approach	Abon is packaged using aluminium foil and glass bottles which are tightly closed. The packaged shreds were stored at 30 º C, 40 º C, and 50 º C for 28 days. The water content of shredded fish continued to decrease during storage. The initial value of water content is 6.9% and after 28 days of storage in aluminium foil the water content changes to 5.91%, while the water content in glass bottles becomes 6.60%. This shows that the water content decreased by 1.09% in aluminium foil packaging and in glass bottles only by 0.3%. This is already very good because according to SII No. 0368-80, 03668-85 for shredded fish products, the maximum water content is 10%.

	Fish floss packaged in glass bottles is better able to hold water vapor than aluminium foil packaging. Moisture content can be blocked better by glass bottle packaging than aluminium foil packaging. This is because glass bottles have thicker walls with smaller pores than aluminium foil. According to Bray (2001) the melting point of silica sand is very high reaching 1700 ºC and then cooled to form solid glass with a high density, compared to the melting point of aluminium which is only 660 ºC and then printed into aluminium foil with thin, brittle layers.
SHELF LIFE ESTIMATION OF CATFISH (Cryptopterus bicirchis) MACARONI PACKED IN HDPE AND ALUMINUM FOIL	From the SNI data where the threshold for macaroni water content shows 12.5%, then the water content observed at the end of the observation concludes that the water content value has passed the predetermined value so that the fish macaroni can no longer be consumed. The results showed that the water content of macaroni fish in HDPE packaging on the 7th day was 9.42% and at the end of the 42nd day of observation, which was 13.29%, it meant that the water content had been rejected. While the value of the water content of macaroni fish jam in aluminium foil packaging on the 7th day is 9.61% and at the end of the 42nd day of observation, which is 13.53%, it means that the water content has been rejected. At the end of the observation, it can be seen that HDPE has a lower moisture content than aluminium foil.

CONCLUSION

Aluminium foil is a type of packaging that is produced using aluminium foil or alufoil as the basic material. In general, this packaging is used for products that need to be protected from sunlight and powder products that clump.

Moisture content is one of the common and important parameters which is required in the quality standard of a food, because the water content in the food ingredients greatly determines the possibility of biochemical reactions (Buckle et al., 1987). According to the Indonesian National Standard, the water content of a fishery product ranges from 4-12%.

REFERENCES

Badan Standarisasi Nasional.SNI 01- 7111.2-2005 Mutu dan Cara Uji Biskuit. Jakarta: BSN, 2005.

Bagem, 2012. Perubahan Mutu Lada Hijau Kering Selama Penyimpanan Pada Tiga Macam Kemasan dan Tingkatan Suhu. Jurnal Littri Vol 18.No.3. Hal 115-124. Bogor: BPTRO dan BBPPP.

Bray, C. 2001. Dictionary of Glass: Materials and Techniques. University of Pennsylvania Press, Philadelphia

Buckle, K.A.R.A Edwards, G. Fleet dan M. Wooton.1987. Food Science.Depatrment of Education and Culture Directorate General of Higher Education. Diterjemahkan oleh Hari Purnomo dan Adiono.Universitas Indonesia. Jakarta 365 hal.

Departemen Perindustrian (Direktorat Jendral Industri Kecil Menengah). 2007. Kemasan Fleksibel. Jakarta.

Julianti, E. dan Mimi, N. 2007. Teknologi Pengemasan. http://www.usu.ac.id/elearning/Teknologi%20Pengemasan/Textbook/thp-407-textbook-teknologi-pengemasan.pdf. Diakses tanggal 4 Maret 2011

Kusnandar, F. 2008. Pendugaan Umur Simpan Produk Pangan dengan Metode Accelerated Shelf- life Testing (ASLT). http://www.foodreview.biz/login/preview. php? View & id= 55843. Diunduh tanggal 21 Maret 2013.

Nagi, H.P., Kaur, j., Dar, B. N., and Sharma, S. 2012. Effect of Storage Period and Packanging on the Shelf Life of Cereal Bran Incorporated Biscuits. Americal Journal of Food Technology, 7(5): 301-310.

Nur M. 2009. Pengaruh cara kemasan, Jenis bahan kemasan, dan Lama penyimpanan terhadap sifat kimia, mikrobiologi, dan organoleptic sate bandeng (Chanos chanos). Jurnal Teknologi dan Industri Hasil Pertanian. 14(2): 1-11.

Standar Nasional Indonesia 01-2908-1992

Standar Nasional Indonesia. SNI 01-3777- 1995. Makaroni. Dewan Standarisasi Nasional.

Syarief. R., S. Santuasa dan Isyana.1989. Teknologi Pengemasan Pangan, Teknologi Pangan. Penerbit Pt. Media. Jakarta.

Winarno, F. G. 2007. Teknobiologi Pangan. M-Brio Biotekindo. Baranangsiang Bogor. 308 halaman.