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Optimisation of browning index of maillard reaction in gelatine powder by response surface methodology (RSM) for halal authentication (Article) [\(Open Access\)](#)

Hamid, A.H.^a, Elgharbawy, A.A.^a, Rohman, A.^b, Rashidi, O.^c, Hammed, H.^d, Nurrulhidayah, A.F.^a [✉](#) [👤](#)^aInternational Institute for Halal Research and Training (INHART), International Islamic University Malaysia (IIUM), Level 3, KICT Building, Jalan Gombak, Selangor 53100, Malaysia^bDepartment of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta, 55281, Indonesia^cHerbarium Unit, Department of Landscape Architecture, Kulliyah of Architecture and Environmental Design, International Islamic University Malaysia, Jalan Gombak, Selangor 53100, Malaysia[View additional affiliations](#) [v](#)

Abstract

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Gelatine, as the product of collagen extraction from animals, is widely used in the food industry. In a glance, the physical properties of gelatine from several sources such as fish, bovine and porcine are similar. Therefore, distinguishing between the sources of gelatine is a tedious task. The differentiation of the gelatine from its sources requires an approach of a chemical reaction. This paper focused on the optimisation of Maillard reaction from different sources of gelatine by Response surface methodology (RSM). The experiment was designed with several imperative parameters; temperature, time and presence of metal ion Cu^{2+} . The response was recorded from the absorbance of reacted gelatine mixture at specific wavenumber (420 nm) through UV-Vis instrumentation. The optimal reaction condition of all type of gelatines in water bath was 95°C for 9 hrs. From solution given, only 5 mM concentration of metal ion Cu^{2+} has an influence on the bovine gelatine compared to fish and porcine gelatine. Maillard reaction with a combination of UV-Vis spectroscopy is one of the convenient protocols for rapid authentication purpose. RSM help to optimize the reaction condition of gelatine from different sources. © 2019 The Authors. Published by Rynnye Lyan Resources.

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-
- 1 Arachchi, S.J.T., Kim, Y.-J., Kim, D.-W., Oh, S.-C., Lee, Y.-B.
Optimization of Maillard reaction in model system of glucosamine and cysteine using response surface methodology
(2017) *Preventive Nutrition and Food Science*, 22 (1), pp. 37-44. Cited 3 times.
<http://pdf.medrang.co.kr/paper/pdf/PNF/2017/022/PNF022-01-06.pdf>
doi: 10.3746/pnf.2017.22.1.37
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-
- 2 Azilawati, M.I., Hashim, D.M., Jamilah, B., Amin, I.
RP-HPLC method using 6-aminoquinolyl-N-hydroxysuccinimidyl carbamate incorporated with normalization technique in principal component analysis to differentiate the bovine, porcine and fish gelatins
(2015) *Food Chemistry*, 172, pp. 368-376. Cited 15 times.
www.elsevier.com/locate/foodchem
doi: 10.1016/j.foodchem.2014.09.093
[View at Publisher](#)
-
- 3 Zelaznik, J.
Unión Cívica Radical: Entre el Tercer Movimiento Histórico y la lucha por la subsistencia
(2013) *Revista SAAP: Sociedad Argentina De Análisis Político*, 7 (2), pp. 423-431. Cited 4 times.
-
- 4 Fadzillah, N.A., Man, Y.B.C., Jamaluddin, M.A., Rahman, S.A., Al-Kahtani, H.A.
Halal food issues from Islamic and modern science perspectives
(2011) *2nd International Conference on Humanities, Historical and Social Sciences*, 171, pp. 59-163. Cited 15 times.
-
- 5 Gu, F.-I., Abbas, S., Zhang, X.-m.
Optimization of Maillard reaction products from casein-glucose using response surface methodology
(2009) *LWT - Food Science and Technology*, 42 (8), pp. 1374-1379. Cited 25 times.
doi: 10.1016/j.lwt.2009.03.012
[View at Publisher](#)
-
- 6 Gómez-Guillén, M.C., Pérez-Mateos, M., Gómez-Estaca, J., López-Caballero, E., Giménez, B., Montero, P.
Fish gelatin: a renewable material for developing active biodegradable films
(2009) *Trends in Food Science and Technology*, 20 (1), pp. 3-16. Cited 250 times.
doi: 10.1016/j.tifs.2008.10.002
[View at Publisher](#)
-
- 7 Hamizah, A., Hamed, A.M., Asiyani-H, T.T., Mirghani, M.E.S., Jaswir, I., Ahamad Fadzillah, N.B.
Evaluation of Catalytic Effects of Chymotrypsin and Cu²⁺ for Development of UV-Spectroscopic Method for Gelatin-Source Differentiation ([Open Access](#))
(2017) *International Journal of Food Science*, 2017, art. no. 2576394.
<http://www.hindawi.com/journals/ijfs/>
doi: 10.1155/2017/2576394
[View at Publisher](#)
-

- 8 Jamaludin, M.A., Zaki, N.N.M., Ramli, M.A., Hashim, D.M., Rahman, S.A.
Istihalah: Analysis on The Utilization of Gelatin in Food Products. 2nd International Conference on Humanities, Historical
(2011) *Social Sciences*, 17, pp. 174-178. Cited 2 times.
-
- 9 Kwak, E.-J., Lim, S.-I.
The effect of sugar, amino acid, metal ion, and NaCl on model Maillard reaction under pH control
(2004) *Amino Acids*, 27 (1), pp. 85-90. Cited 92 times.
doi: 10.1007/s00726-004-0067-7
[View at Publisher](#)
-
- 10 Lan, X., Liu, P., Xia, S., Jia, C., Mukunzi, D., Zhang, X., Xia, W., (...), Xiao, Z.
Temperature effect on the non-volatile compounds of Maillard reaction products derived from xylose-soybean peptide system: Further insights into thermal degradation and cross-linking
(2010) *Food Chemistry*, 120 (4), pp. 967-972. Cited 86 times.
doi: 10.1016/j.foodchem.2009.11.033
[View at Publisher](#)
-
- 11 Nhari, R.M.H.R., Ismail, A., Che Man, Y.B.
Analytical methods for gelatin differentiation from bovine and porcine origins and food products
(2012) *Journal of Food Science*, 77 (1), pp. R42-R46. Cited 16 times.
doi: 10.1111/j.1750-3841.2011.02514.x
[View at Publisher](#)
-
- 12 Sumaya-Martinez, M.T., Thomas, S., Linard, B., Binet, A., Guerard, F.
Effect of Maillard reaction conditions on browning and antiradical activity of sugar-tuna stomach hydrolysate model system
(2005) *Food Research International*, 38 (8-9), pp. 1045-1050. Cited 44 times.
doi: 10.1016/j.foodres.2005.03.015
[View at Publisher](#)
-
- 13 Tamanna, N., Mahmood, N.
Food processing and maillard reaction products: Effect on human health and nutrition ([Open Access](#))
(2015) *International Journal of Food Science*, 2015, art. no. 526762. Cited 68 times.
<http://www.hindawi.com/journals/ijfs/>
doi: 10.1155/2015/526762
[View at Publisher](#)
-
- 14 Tan, T.-C., Alkarkhi, A.F.M., Easa, A.M.
Assessment of the ribose-induced Maillard reaction as a means of gelatine powder identification and quality control
(2012) *Food Chemistry*, 134 (4), pp. 2430-2436. Cited 9 times.
doi: 10.1016/j.foodchem.2012.04.049
[View at Publisher](#)
-

□ 15 Yang, C., Song, H.L., Chen, F.

Response Surface Methodology for Meat-like Odorants from Maillard Reaction with Glutathione I: The Optimization Analysis and the General Pathway Exploration

(2012) *Journal of Food Science*, 77 (9), pp. C966-C974. Cited 9 times.
doi: 10.1111/j.1750-3841.2012.02863.x

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🔍 Nurrulhidayah, A.F.; International Institute for Halal Research and Training (INHART), International Islamic University Malaysia (IIUM), Level 3, KICT Building, Jalan Gombak, Selangor, Malaysia;
email:nurrulhidayah@iium.edu.my
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