

## Enrichment of table eggs with selenium and lutein – our experiences

Zlata KRALIK, Gordana KRALIK, Manuela GRČEVIĆ, Danica HANŽEK

### References

- Aljamal, A.A., Purdum, S.E., Hanford, K.J. (2014) The effect of normal and excessive supplementation of selenomethionine and sodium selenite in laying hens. *International Journal of Applied Poultry Research*, 3 (3), 33-38.
- Chung, H.Y., Rasmussen, H.M., Johnson, E.J. (2004) Lutein bioavailability is higher from lutein-enriched eggs than from supplements and spinach in men. *The Journal of Nutrition*, 134 (8), 1887-1893. DOI: <https://dx.doi.org/10.1093/jn/134.8.1887>
- Fašiangová M., Bořilová G., Hulánková R. (2017) Effect of Dietary Se Supplementation on the Se Status and Physico-chemical Properties of Eggs – a Review. *Czech Journal of Food Science*, 35 (4), 275-284. DOI: <https://dx.doi.org/10.17221/370/2016-CJFS>
- Ferencik, M, Ebringer, L. (2003) Modulatory effects of selenium and zinc on the immune system. *Folia Microbiologica (Praha)*, 48 (3), 417-426. DOI: <https://dx.doi.org/10.1007/BF02931378>
- Gajčević, Z., Kralik, G., Has-Schon, E., Pavić, V. (2009) Effects of organic selenium supplemented to layer diet on table egg freshness and selenium content. *Italian Journal of Animal Science*, 8 (2), 189-199. DOI: <https://dx.doi.org/10.4081/ijas.2009.189>
- Gale, C.R., Hall, N.F., Phillips, D.I., Martyn, C.N. (2001) Plasma antioxidant vitamins and carotenoids and age-related cataract. *Ophthalmology*, 108 (11), 1992-1998. DOI: [https://dx.doi.org/10.1016/S0161-6420\(01\)00833-8](https://dx.doi.org/10.1016/S0161-6420(01)00833-8)
- Gao, S., Qin, T., Liu, Z., Caceres, M.A., Ronchi, C.F., Chen, C.Y., Yeum, K.J., Taylor, A., Blumberg, J.B., Liu, Y., Shang, F. (2011) Lutein and zeaxanthin supplementation reduces H<sub>2</sub>O<sub>2</sub>-induced oxidative damage in human lens epithelial cells. [Online] *Molecular Vision*, 17, 3180-3190. Available at: <http://www.molvis.org/molvis/v17/a343/> [Accessed 20 April 2018].
- Golzar Adabi, S.H., Kamali, M.A., Davoudi, J., Cooper, R.G., Hajbabaei, A. (2010) Quantification of lutein in egg following feeding hens with a lutein supplement and quantification of lutein in human plasma after consumption of lutein enriched eggs. [Online] *Archiv für Geflügelkunde*, 74(3), 158-163. Available at: <https://www.european-poultry-science.com/Quantification-of-lutein-in-egg-following-feeding-hens-with-a-lutein-supplement-and-quantification-of-lutein-in-human-plasma-after-consumption-of-lutein-enriched-eggs.QUIEPTQyMTk2ODImTUIEPTe2MTAxNA.html> [Accessed 24 April 2018].
- Grčević, M, Kralik, Z., Kralik, G., Radišić, Ž., Mahmutović, H. (2014) Increase of the lutein content in hens' eggs. In Popović, Zoran (ur.) *Proceedings of the International Symposium on Animal Science*. Beograd: University of Belgrade, Faculty of Agriculture. 637-642. Available at: <http://arhiva.nara.ac.rs/bitstream/handle/123456789/724/91%20Livestocksym%202014%20-%20Grcevic%20et%20al.pdf?sequence=1&isAllowed=y> [Accessed 20 April 2018].
- Grčević, M. (2015) *Obogaćivanje konzumnih jaja luteinom*. Doktorska disertacija. Osijek: Poljoprivredni fakultet u Osijeku. 121.
- Jing, C.L., Dong, X.F., Wang, Z.M., Liu, S., Tong, J.M. (2015) Comparative study of DL-selenomethionine vs sodium selenite and seleno-yeast on antioxidant activity and selenium status in laying hens. *Poultry Science*, 94 (5), 965-975. DOI: <https://dx.doi.org/10.3382/ps/pev045>
- Kralik, G., Gajčević, Z., Suchy, P., Strakova, E., Hanžek, D. (2009) Effects of dietary selenium source and storage on internal quality of eggs. *Acta Veterinaria Brno*, 78 (2), 219-222. DOI: <https://dx.doi.org/10.2754/avb200978020219>

- Kralik, G., Kralik, Z., Grčević, M., Kralik, I., Gantner, V. (2018) Enrichment of table eggs with functional ingredients. *Journal of Central European Agriculture*, 19 (1), 72-82.  
DOI: <https://dx.doi.org/10.5513/JCEA01/19.1.2025>
- Kralik, Z., Grčević, M., Radišić, Ž., Kralik, I., Lončarić, Z., Škrtić, Z. (2016) Effect of selenium-fortified wheat in feed for laying hens on table eggs quality. [Online] *Bulgarian Journal of Agricultural Science*, 22 (2), 297-302. Available at: <http://www.agrojournal.org/22/02-21.pdf> [Accessed 22 April 2018].
- Kralik, Z., Lončarić, Z., Grčević, M., Radišić, Ž., Galović, D., Cimerman, E. (2017) Utjecaj korištenja biofortificiranog kukuruza u hrani za nesilice na kvalitetu jaja kokoši hrvaticе. In Antunović, Zvonko (ur.) *Zbornik radova 52. hrvatskog i 12. Međunarodnog simpozija agronoma*. Vila, Sonja. Osijek: Poljoprivredni fakultet u Osijeku, 528-533. Available at: [http://sa.agr.hr/pdf/2017/sa2017\\_proceedings.pdf](http://sa.agr.hr/pdf/2017/sa2017_proceedings.pdf) [Accessed 20 April 2018].
- Kryukov, G.V., Castellano, S., Novoselov, S.V., Lobanov, A.V., Zehtab, O., Guigo, R. Gladyshev, V.N. (2003) Characterization of mammalian selenoproteomes. *Science*, 300 (5624), 1439-1443.  
DOI: <https://dx.doi.org/10.1126/science.1083516>
- Landrum, J.T., Bone, R.A. (2001) Lutein, zeaxanthin, and the macular pigment. *Archives of Biochemistry and Biophysics*, 385 (1), 28-40. DOI: <https://dx.doi.org/10.1006/abbi.2000.2171>
- Leeson, S., Caston, L. (2004) Enrichment of eggs with lutein. *Poultry Science*, 83 (10), 1709-1712.  
DOI: <https://dx.doi.org/10.1093/ps/83.10.1709>
- Leeson, S., Caston, L., Namkung, H. (2007) Effect of dietary lutein and flax on performance, egg composition and liver status of laying hens. *Canadian Journal of Animal Science*, 87 (3), 365-372.  
DOI: <https://dx.doi.org/10.4141/A06-043>
- Pan, C., Huang, K., Zhao, Y., Qin, S., Chen, F., Hu, Q. (2007) Effect of selenium source and level in hen's diet on tissue selenium deposition and egg selenium concentrations. *Journal of Agricultural and Food Chemistry*, 55 (3), 1027-1032. DOI: <https://dx.doi.org/10.1021/jf062010a>
- Paton, N.D., Cantor, A.H., Pescatore, A.J., Ford, M.J., Smith, C.A. (2002) The effect of dietary selenium source and level on the uptake of selenium by developing chick embryos. *Poultry Science*, 81 (10), 1548-1554. DOI: <https://dx.doi.org/10.1093/ps/81.10.1548>
- Skřivan, M. (2009) Zvýšení obsahu selenu ve vejcích: Metodika [Online.] Prague: Institute of Animal Science. Available at: <https://anzdoc.com/vyzkumny-ustav-ivoine-vyroby-vvi-praha-uhinves-metodika-zvyve.html> [Accessed 23 April 2018].
- Surai, P.F. (2000) Organic selenium and the egg: Lessons from nature. [Online] *Feed Compounder*, 20, 16–18. Available at: [https://www.researchgate.net/publication/283153317\\_Organic\\_selenium\\_and\\_the\\_egg\\_Lessons\\_from\\_nature](https://www.researchgate.net/publication/283153317_Organic_selenium_and_the_egg_Lessons_from_nature) [Accessed 22 April 2018].