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## UTJECAJ DODATKA SELENA U HRANU SVINJA NA PROIZVODNA SVOJSTVA, ANTIOKSIDATIVNI STATUS I KVALITETU MESA

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### *Disertacija (2)*

U porastu je proizvodnja hrane koja sadrži funkcionalne sastojke kojima bi se postigao pozitivan učinak na očuvanje zdravlja i smanjenje rizika od nastanka bolesti. Također je vrlo važno podizanje kvalitete svinjskoga mesa, s obzirom na to da se promjenom genetskoga sastava svinja podigla mesnatost, ali je to u obrnutome odnosu s kvalitetom mesa.

U ovom se istraživanju pratila djelotvornost dodatka viših koncentracija organskoga selena u obroku tovnih svinja u odnosu na njihov rast, otpornost, antioksidativnu snagu, kvalitetu mesa i mogućnost obogaćivanja mesa selenom. Pokus je proveden na 100 svinja (križanaca WJxSLxP) obaju spolova, od 28 kg do 98 kg tjelesne mase u trajanju od 98 dana. Prasad je hranjena gotovom krmnom smjesom za tov do 60 kg (ST-1) i smjesom za tov do 100 kg (ST-2) uz dodatak, prema skupinama kako slijedi: K-0,3 mg/kg organskoga selena, P1-0,5 mg/kg anorganskoga selena, P2-0,5 mg/kg organskoga selena, P3-0,5 mg/kg organskoga selena +0,2 %zeolita klinoptilolita obrađenoga vibrotehnologijom i P4-postupno povećanje selena, tako da je posljednji mjesec koncentracija bila 0,7 mg/kg hrane organskoga selena.

Sve skupine svinja hranjene povišenom koncentracijom organskoga selena imale su veći udio limfocita, osobito CD4 T limfocita. Aktivnost glutation peroksidaze bila je viša u svim skupinama hranjenih povišenom koncentracijom selena, a značajno veća u P3 i P4 skupinama 71. i 98. dana. Aktivnost glutation reduktaze bila je značajno veća u P3 i P4 skupini 98. dana u odnosu na kontrolu. Pokazatelji antioksidacije ukazuju na pojačanu antioksidativnu zaštitu u skupinama s dodatkom 0,5 ppm organskoga selena i iste formulacije selena uz dodatak zeolita u uvjetima stresa intenzivne proizvodnje svinja. Nisu utvrđene razlike u proizvodima lipidne peroksidacije (TBARS) u svježem mesu, niti u mesu nakon tjedan dana čuvanja u hladnjaku. Uz dodatak 0, 5 ppm organskoga selena (P2) u hrani svinja utvrđen je statistički značajno ( $P < 0,01$ ) veći udio tamnih vlakana u dugom leđnom mišiću u odnosu na kontrolu. Sve skupine hranjene uz dodatka više koncentracije selena imale su više oksidativnih

vlakana, što utječe na sporiji pad pH, manje laktata, manje blijedo i vodnjikavo meso. Dodatak organskoga selena u koncentraciji od 0,5 ppm sam i uz dodatak klinoptilolita pokazao je podizanje imunog odgovora, veću antioksidativnu zaštitu i veće povećanje selena u mesu, u smislu proizvodnje namirnice s obilježjem funkcionalne hrane.

Ključne riječi: svinja, organski selen, zeolit, antioksidativni status, kvaliteta svinjskoga mesa

## EFFECT OF SELENIUM SUPPLEMENTATION ON PIG PRODUCTION PROPERTIES, ANTIOXIDANT STATUS AND MEAT QUALITY

### *Doctoral thesis*

Food containing functional ingredients to achieve a positive effect on health and reducing the risk of infection is increasing production. It is also very important to improve the quality of pork with respect to change the genetic makeup of pigs that raised leanness, being inversely correlated with the quality of meat.

This study monitored the effectiveness of addition of higher doses of organic selenium in the diet of fattening pigs in relation to their growth, immunity, antioxidant power, the quality of meat and possibility of meat enriching with selenium. The experiment was carried out on 100 pigs (crossbred WJxSLxP) of both sexes, from 28 kg to 98 kg body weight during a period of 98 days. Piglets fed the finished feed mixture for fattening up to 60 kg (ST-1) and a mixture for fattening up to 100 kg (DM-2) in addition, by the groups as follows: K-0.3 mg/kg organic selenium, P1-0.5 mg/kg inorganic selenium, P2-0.5 mg/kg organic selenium, P3-0.5 mg/kg organic selenium +0.2% zeolite clinoptilolite treated vibrotechnology and P4-gradual increase in selenium so that the concentration of the last month was 0.7 mg/kg diet of organic selenium.

All groups of pigs fed high concentration of organic selenium had a higher proportion of lymphocytes, especially CD4 T lymphocytes. Glutathione peroxidase activity was higher in all groups fed elevated selenium

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levels and significantly higher in the P3 and P4 groups 71st and 98th days of the trials. Glutathione reductase was significantly higher in the P3 and P4 group 98th days compared to the control. Antioxidant indicators suggested increased antioxidant protection in groups supplemented with 0.5 ppm organic selenium and selenium formulations of the same with the addition of zeolite under stress intensive pig production. No differences were found in the products of lipid peroxidation (TBARS) in raw meat or in meat after a week in refrigerator storage. By histological examination statistically higher level of dark fibers with 0.5 ppm organic selenium dietary addition (P2) was determined in

relation to the control. All groups fed higher selenium concentration had more oxidative fibers which affect on slower pH drop, less lactate and less pale, soft and exudative pork. Addition of organic selenium at a dose of 0.5 ppm alone and with the addition of zeolite showed an immune response raise, higher antioxidant protection and greater increase of selenium in meat production in terms of foods having characteristics of functional food.

Key-words: pig, organic selenium, zeolite, antioxidant status, pork quality