When selenium yeast was supplemented to provide 0.1–0.3 ppm selenium in poultry diets, significant benefits were observed in carcass quality and muscle selenium content.

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Organic selenium in nature, animals receive selenium in their diets mainly in the form of selenium methionine (Combs, 1984) and minor amounts of several other selenoamino acids. The development and commercialization of the organic selenium product known as selenium yeast in the U.S. (maximum content: 0.3 parts per million selenium), and minor amounts of several other selenoamino acids they would obtain naturally from selenium-ad- equate feed ingredients.

Selenium yeast products typically contain greater than 50% of total selenium as thiolated selenium methionine. By calculation, if a 2,000 ppm (0.2000%) selenium yeast product contains 63% of total selenium as methionine (40.26% of selenium methionine by weight), the methionine selenium content would be 0.313% in the product [0.2000% selenium x 0.63/0.4026 = 0.313%]. Using an in vitro tripson digestion technique, Yoshida et al. (2002) determined that a high-selenium yeast product was highly digestible and, therefore, concluded that the bioavailability of selenium in selenium yeast is high.

Due to its low toxicity, selenium yeast has had an excellent safety record in human and animal studies (Schrauzer, 2006).

Better dispersion of selenium from selenized feeds compared to sodium selenite in feeds has been reported (Vukasinovic et al., 2006).

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Carcass quality

Following are results from several broiler chicken feeding and processing trials published between 2000 and 2006 in which selenium yeast (Sei-Plex, Altech Inc.) was supplemented to the diets.

In a broiler pen trial conducted in China in 2000, broiler chicks were fed 0.15 or 0.3 ppm selenium from sodium selenite or selenium yeast at 9 days of age. Results are shown in Table 1. Selenium yeast supplying 0.30 ppm selenium decreased meat lowness compared to an equal amount of sodium selenite. Drip loss percentage was decreased in the group receiving 0.15 or 0.30 ppm selenium from selenium yeast compared to the negative control group fed the basal diet. TBARS, an index of lipid peroxidation and oxidative stress, was lower in meat from the 0.15 ppm selenium group fed selenium yeast compared to the negative control and the group fed 0.30 ppm selenium from sodium sele- nite (European Commission, 2006). A broiler chicken trial con- ducted in Australia in 1999 with male chicks to 38 days of age (final weight about 2.2 kg). Feed and feeds were supplemented with ei- ther 0.1 or 0.25 ppm selenium from either sodium selenite or selenium yeast. The main results are shown in Table 2 (European Commission, 2006).

Edens (2001) noted that dietary organic selenium itself is not able to decrease drip loss of water from meat, but selenium intake, in effect, increased due to its pro-oxidant properties. Therefore, replacement of sodium selenite with selenium yeast is associated with decreased drip loss.

After reviewing broiler and pig drip loss experiments, Sural (2006) stated that it was obvious that in- creased selenium yeast supplyments (0.25 ppm selenium) had ad- ditional benefits over controls (to 0.1 ppm selenium) on the preven- tion of drip loss from meat. The incidence of pale-soft-exudative broiler chicken was effectively reduced by supplemental selenium yeast (0.3 ppm selenium), and a lower concentration of selenium (0.1 ppm) from selenium yeast was equivalent to, or better than, the higher level of selenium (0.3 ppm) from sodium selenite at reducing the frequency of pale-soft-exudative meat (Edens, 2001). Inclusion of organic selenium into the diet improved eviscerated weight and breast yield of broiler chickens, according to Naylor et al. (2000). In two preliminary broiler trials (Chot and Naylor, 2004) in Australia, it was found that in- creased dietary selenium levels markedly improved feed conversion ratio as a result of lower feed intake by the chickens while maintaining the same weight gain.

Selenium supplementation in- creased feathering, with selenium yeast being more effective than sodium selenite as a source of selenium. Broilers receiving dietary organic selenium had improved eviscerated weight and breast yield and reduced drip loss. Chot and Naylor (2004) reported that selenium yeast providing 0.1 ppm added selenium improved feather score and decreased 24-hour drip loss as well as causing a mark- edly higher selenium deposition rate in breast muscle and lower selenium excretion rate in excreta compared to an equal amount of se- lenium from sodium selenite (Tables 3 and 4).

Payne and Southern (2005) conducted a 64-day sex-separate broiler chicken pen trial to compare three- phase basal diets with the same diets supplemented with either 0.3 ppm selenium from sodium selenite or 0.3 ppm selenium from selenium yeast. The selenium yeast-fed broil- ers had significantly increased mus-