

The comparison of Sel-Plex and sodiumselenite to counteract the negative aspects of feed rancidity and mycotoxins favors the use of Sel-Plex

I.A. EGOROV¹, N.Y. CHESNOKOVA¹ and L. NOLLET^{2*}

¹All-Russian Institute of Poultry Farming, Sergiev Posad, Russia; ²Alltech Biotechnology Centre, Dunboyne, Ireland

*Corresponding author: lnollet@alltech.com

A 37 d broiler trial was set up using 6 groups of 35 birds per treatment in order to evaluate the effect of providing Se under form of sodium selenite or Sel-Plex when stressors like fat rancidity or aflatoxine are present in the feed. Three different feeds were used: a normal feed, a feed in which 1 % oil was replaced with rancid oil and a feed containing 20 % of corn naturally contaminated with aflatoxine B1 (AFB1) 37 ppb. To each of the feed, 0.3 ppm Se either as sodiumselenite or Sel-Plex (Alltech Inc., USA) was added, so to reach the 6 different treatments in this trial (3 feeds, 2 treatments). At the end of the trial (37 days), 6 animals per treatment were slaughtered and the Vit. A and E level in the liver was measured using HPLC. Results were analysed by Anova. Significance was stated if $P < 0.05$.

Both feed containing rancid oil and naturally AFB1 contaminated corn decreased the performance compared to the normal feed when sodium selenite was included (1984 and 1962 g respectively versus 2110 g for the normal feed) and when Sel-Plex was added (2042 and 2030 g respectively versus 2159 for the normal feed). Supplementation of Sel-Plex instead of sodium selenite to the normal, rancid or aflatoxine contaminated feed improved growth with 39, 58 and 68 g respectively while FCR was reduced by using Sel-Plex by 0.02, 0.06 and 0.05 points. In general, the effect of Sel-Plex was more pronounced in the diets containing some growth reducing substances or raw materials.

No significant changes for Vit A and E in the liver could be noted, but some trends were visible. In general, feeding the rancid oil or the AFB1 feed reduced levels of Vit. A and E slightly in the liver. While vit A levels in normal, rancid oil and AFB1 feed was 211, 200 and 201 ppm when sodiumselenite was in the feed, these values rose to 215, 204 and 205 when Sel-Plex was added. Similarly, levels of Vit E raised from 7.8, 7.3 and 7.2 in normal, rancid oil and AFB1 feed to 7.9, 7.5 and 7.6 respectively when sodiumselenite was replaced by Sel-Plex.

It can be concluded from this trial that the difference in effect on Sel-Plex compared to sodiumselenite increases when feed stressors are applied, and that this beneficial effect on performance is most probably attributable to a combined improvement of many (biochemical) factors in the animal.

Keyword: sodium selenite; Sel-Plex; broiler; rancidity; aflatoxine

Introduction

The use of Se has been shown to give positive effect in broiler production when animals are in a state of stress. However, there is still little information present on the positive effect of Se provided under organic or inorganic form on counteracting different stressors in the feed. The objective of this trial was to evaluate the effect of supplementation of Se either under inorganic or organic form to counteract stressors like the presence of rancid oil in the feed (1 %, in order to simulate feed become rancid after production and before feeding) or subclinical levels of aflatoxins on broiler production.

Material and methods

A 37 d broiler trial was set up using 6 groups of 35 birds per treatment (cages, Cobb 500). Three different feeds (*Table 1*) supplemented with 0.3 ppm Se from sodiumselenite or Sel-Plex (Alltech Inc., USA). Performance and FCR at 37 days. At 37d, 6 animals per treatment were slaughtered and the Vit. A and E level in the liver was measured using HPLC. Results were analysed by Anova. Significance was stated if $P < 0.05$. No statistics could be done on the performance data as only one replicate was present.

Table 1 Overview of the different treatments

	Selenium source (0,3 ppm added)	Feed
1	Sodium selenite	Basal feed
2	Sel-Plex	Basal feed
3	Sodium selenite	Basal feed + 1 % Rancid oil*
4	Sel-Plex	Basal feed + 1 % Rancid oil*
5	Sodium selenite	Basal feed + 20 % contaminated corn**
6	Sel-Plex	Basal feed + 20 % contaminated corn**

* KOH: 48 mg/g, Iodine value: 0.27 %

** corn contains aflatoxine B1 37 ppb

Results and discussion

Both feed containing rancid oil and naturally AFB1 contaminated corn decreased the performance compared to the normal feed when sodium selenite was included when Sel-Plex was added (*Figure 1 and 2*). Supplementation of Sel-Plex instead of sodium selenite to the normal, rancid or aflatoxine contaminated feed improved growth with 39, 58 and 68 g respectively (*Figure 1*) while FCR was reduced by using Sel-Plex by 0.02, 0.06 and 0.05 points (*Figure 2*). In general, feeding the rancid oil or the AFB1 feed reduced levels of Vit. A and E slightly in the liver (*Table 2*). While vit A levels in normal, rancid oil and AFB1 feed was 211, 200 and 201 ppm when sodiumselenite was in the feed, these values rose to 215, 204 and 205 when Sel-Plex was added. Similarly, levels of Vit E raised from 7.8, 7.3 and 7.2 in normal, rancid oil and AFB1 feed to 7.9, 7.5 and 7.6 respectively when sodiumselenite was replaced by Sel-Plex.

Table 2: Vitamine A and E levels in the liver

	Basal		Rancid oil		Affl. contam. corn	
	Selenite	Sel-Plex	Selenite	Sel-Plex	Selenite	Sel-Plex
Vit. A, ppm	211	215	200	204	201	205
Vit. E, ppm	7,8	7,9	7,3	7,5	7,2	7,6

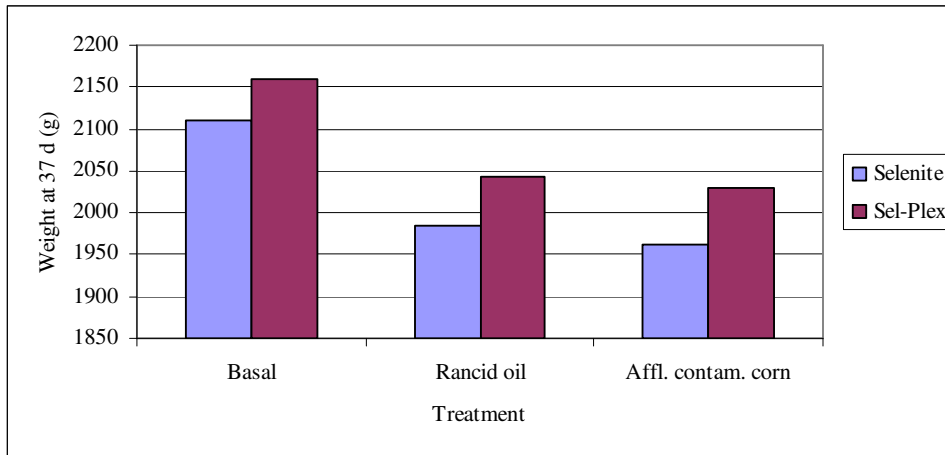


Figure 1 The effect of the different treatments on 37 day broiler weight

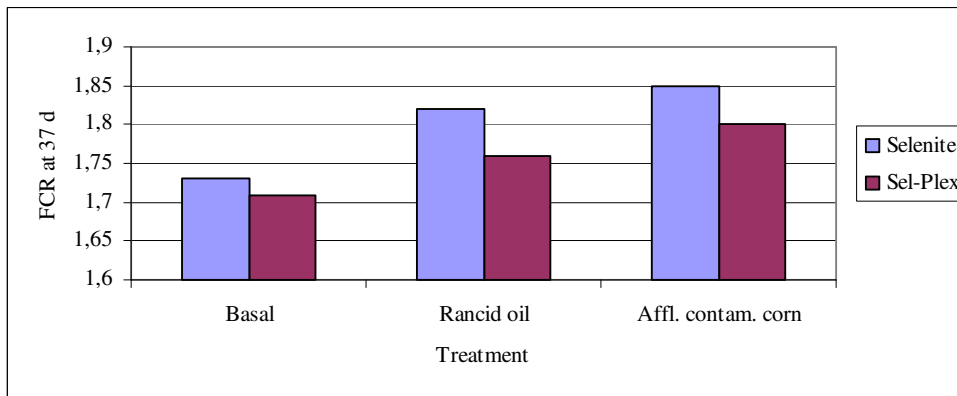


Figure 2 The effect of the different treatments on 37 day FCR

It can be concluded from this trial that the difference in effect on Sel-Plex compared to sodiumselenite increases when feed stressors are applied, and that this beneficial effect on performance is most probably attributable to a combined improvement of many (biochemical) factors.