

Effect of replacement of soybean meal with increasing levels of sunflower meal combined with Allzyme Vegpro and Allzyme PT in layer diets

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A 12 week layer trial (12 tr x 24 x 3 layers, aged 36 weeks at start) was set up using 6 feeds in which soybean was gradually replaced by sunflower meal (SFM) at 0, 5, 10, 15, 20 or 25 % while keeping feeds isocaloric and -nitrogenous. Half of the animals on one of these feed were supplemented with 16000 HUT/g protease (Allzyme Vegpro, Alltech Inc., USA) and 300 XU/g xylanase (Allzyme PT, Alltech Inc., USA) added on top of the feed thus creating the 12 treatments. Laying percentage, average egg weight, average egg mass production and FCR were recorded weekly during the trial period. An ANOVA, two- factor with replication was performed and considered significant when $P < 0.05$. Laying percentage was reduced by increasing levels of sunflower from 83.4 to 79.3 % at 25 % SFM although only significantly by the highest SFM dietary level; The enzyme addition reduced the negative effect of SFM on lay performance and this effect increased with increasing level of SFM. FCR increased non significantly by increasing the dietary SFM level, while addition of the enzymes reduced this upward trend and kept FCR constant for all SFM levels. Increasing levels of SFM also increased No of dirty eggs, an effect which counteracted partly by supplementation with enzymes. It can be concluded that SFM can be added in layer diets safely to 15-20 % if the appropriate level of xylanase and proteases (Allzyme PT and Allzyme Vegpro) are added.

Keyword: Sunflower meal; Allzyme Vegpro; Allzyme PT; layers

Introduction

Substituting soybean meal with sunflower meal could reduce feeding cost to layers quite significantly. However as sunflower has higher levels of non-starch polysaccharides and protein digestibility is lower, the use of an appropriate xylanase and protease might be beneficial. The objective of this trial was to evaluate the effect of substituting soybean meal with sunflower meal on lay performance, and to evaluate if the effect of the addition of a xylanase in combination with a protease could enhance performance when high levels of sunflower meal were used.

Material and methods

432 Roso SL-2000 commercial layer hybrid throughout the age interval 36-47 weeks were assigned to 12 groups with 24 replicates per group (one replicate = 3 layers). Six feeds were formulated by replacing soybean meal (44 % crude protein) with either 0, 5, 10, 15, 20 or 25 % of sunflower meal (SFM, 34.4 % crude protein). Feeds were isocaloric and isonitrogenous. Each feed treatment was split up in two parts, one part being supplement with a mixture of Allzyme Vegpro and Allzyme PT at 1.5 kg/T while the other part was used as control (in total thus 12 treatments). The mixture consisted out of 16000 HUT/g protease (from Allzyme Vegpro, Alltech Inc., USA) and 300 XU/g xylanase (from Allzyme PT, Alltech Inc., USA).

Laying percentage, average egg weight, average egg mass production and FCR were recorded weekly while number of dirty eggs and eggs with shell defects were measured continuously. The experimental data were processed statistically by variance analysis with ANOVA, two-factor with replication. Results are considered significant when $P < 0.05$.

Results and discussion

Laying percentage was reduced by increasing levels of sunflower from 83.4 to 79.3 % at 25 % SFM although only significantly by the highest SFM dietary level (25%). Adding the enzyme mixture reduced the negative effect of SFM on lay performance, and this effect increased with increasing level of SFM (82.0 % versus 79.3 % at 25 % SFM) (Figure 1 and Figure 2).

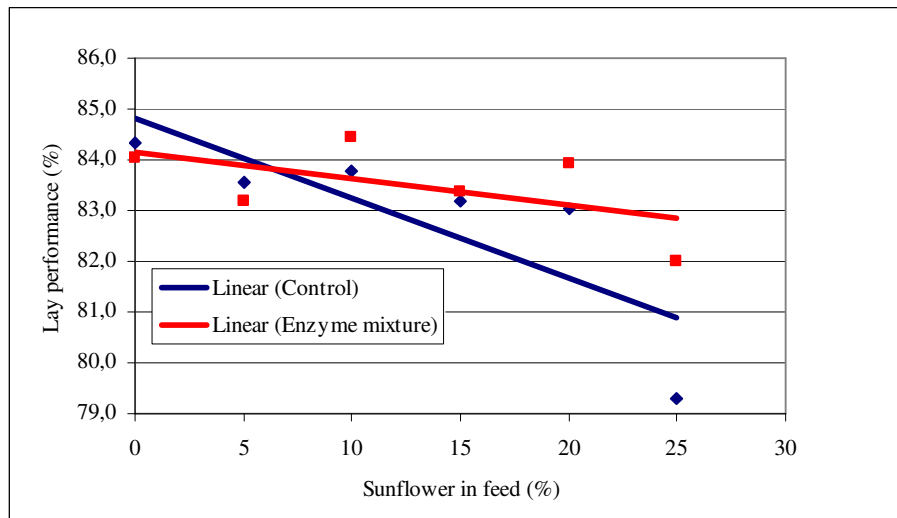


Figure 1 Effect of substituting soybean meal with sunflower meal with or without enzyme addition on lay performance

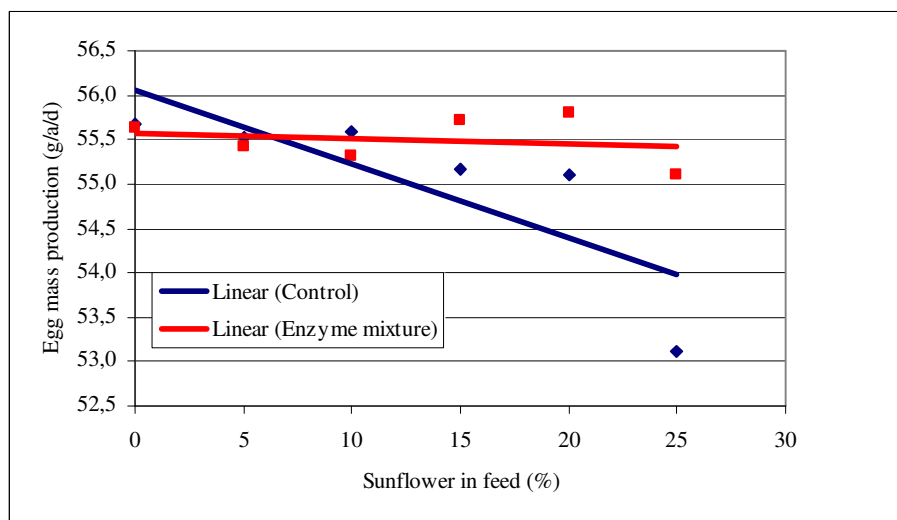


Figure 2 Effect of substituting soybean meal with sunflower meal with or without enzyme addition on egg production

Feed conversion into eggs was not influenced significantly by the dietary SFM level, however

increased in the controls from 2.26 to 2.30 with increasing levels of SFM. Inclusion of Allzyme Sunflower reduced this upward trend in feed conversion, and kept it constant at about 2.26 (Figure 3).

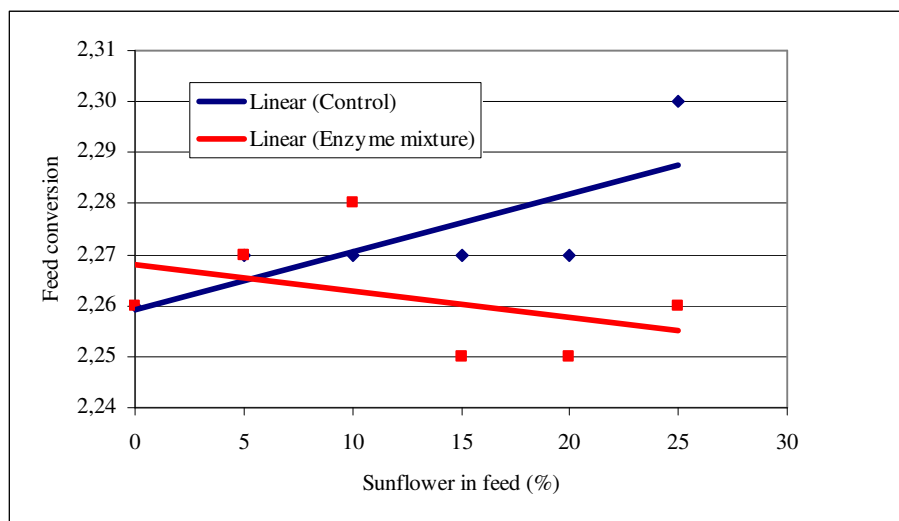


Figure 3: Effect of substituting soybean meal with sunflower meal with or without enzyme addition on FCR

An increase of the proportion of eggs with shell faults and dirty shells in the groups treated with the highest dietary SFM levels was noted (up to 4.5 % dirty eggs and 1 % eggs with shell faults), but the diet supplementation with Allzyme Sunflower powder alleviated these adverse effects to some extent by decreasing the proportion of dirty eggs, particularly in the groups treated with higher dietary SFM levels (Figure 4).

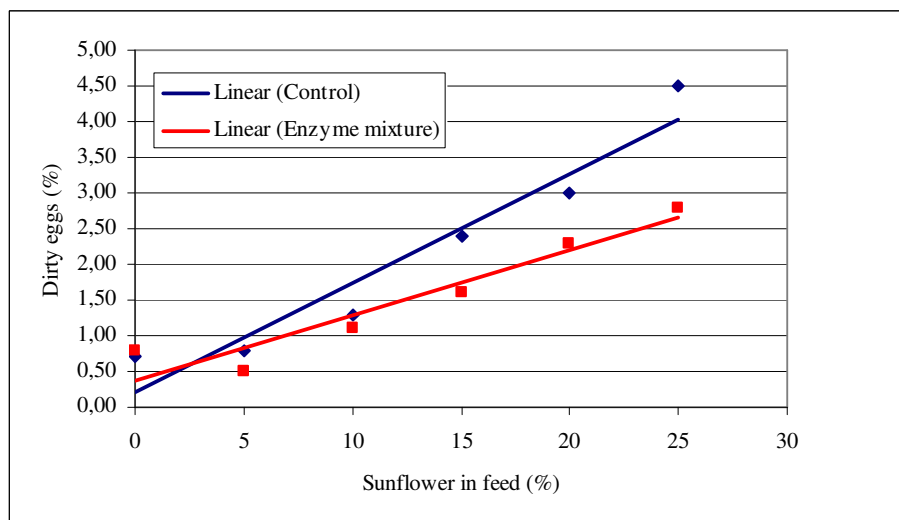


Figure 4 Effect of substituting soybean meal with sunflower meal with or without enzyme addition on percentage of dirty eggs

It can be concluded from this trial that in layer diets SFM can be added to replace soybean meal to levels of 25 % when an enzyme mixture consisting out of 16000 HUT/g protease (from Allzyme Vegpro) and 300 XU/g xylanase (from Allzyme PT) was added at 1.5 kg/T. However, considering the number of eggs with dirt spot and shell faults, a maximum of 15 to 20 % is probably more advisable in practice.