Productive parameters and carcass quality of broiler chickens fed yeast (S. cerevisiae)

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Summary

Saccharomyces cerevisiae is used in broiler diets as a natural additive and probiotic to improve performance of chickens. In this work effect of yeast over productive parameters and carcass quality of broilers was checked. One hundred broiler males Ross were fed starter (1-30 days old) and finishing ration (30-52 days old). At 30 days of age, the chickens were distributed into 20 pens with five birds per pen and five pens per ration. The Diets were: 1. Control, commercial type feed with 0.10% premix, without Yeast; 2. Control with 0.05 % of premix, without Yeast, 3. Diet 2 with 0.15% Yeast and 4. Diet 2 with 0.30% Yeast.

At 30 to 52 days old the following parameters were measured: Average Daily Consumption (ADC), Average Daily Gain (ADG) and Conversion Index (CI). At the end of the experiment, two birds for pen (forty chickens) were weighed to obtain carcass performance and killed for estimation of breast-, leg muscles and abdominal fat weight. An ANOVA test was applied to a completely randomized design followed by a Tukey test. The chickens fed brewer’s yeast, in higher percentage and replacing vitamin-mineral premix, had significantly higher ADG and better CI but similar ADC. Then, for ADG when adding 0.3 yeast the chickens had 11% more weight gain than the controls and diet 2 and 10,8% lower brewer’s yeast level, respectively (p ≤ 0.05). For CI, the broilers fed diet 4 were more efficient than the others (p ≤ 0.05). Breast- and leg muscle weight and carcass performance showed no significant differences. The chickens fed yeast accumulated significantly (p ≤ 0.05) 12% and 15% less fat abdominal weight than the others, which Diet 1 and 2 (without yeast), respectively. It could be concluded that the addition of brewer’s yeast, acted as a real natural growth, promoter improving productivity parameters and carcass quality.

Introduction

Saccharomyces cerevisiae is used in broiler diets as a natural additive to provide vitamin, especially “B”, protein with good biological value and without toxic, allergenic or carcinogenic compounds (Stone, 1998). It also, results in improved digestibility and absorption of nutrients and controlling infections by enteric pathogens. This natural additive, adds intrinsic nutrients, resulting in a better productive performance in the chickens (Cruickshank, 2002).

During the last fifteen years, our research team has used brewer’s yeast at different levels and ages of the birds. So, the conversion index and final weight was better when 0.3-0.5% brewer’s yeast in broiler starter and finisher diets was added (Miazzo, et al., 1994, 1995). In another research, we confirmed the improved productive variables when including 0.6-0.9 brewer’s yeast (Miazzo, et al., 1997, 1998). In another experience, when adding 0.5 and 1% yeast in the finishing diet, average daily gain and conversion index were better than the control (Miazzo et al., 2000).

Other researches found better weight gain and conversion index in broiler fed 0.2-1% of Saccharomyces cerevisiae in the diets. Also, the addition of 5-20 % of brewer’s yeast in the broiler diets, improved the productive parameters (Churchil et al., 2000, Yalcin et al., 1993 and Yadav et al., 1994).

In other reports, the addition of yeast with different combinations of antibiotics and probiotics, both in starter as in finisher ration broilers, increased growth rate and conversion efficiency (Maiorka et al., 2001, Onifade et al., 1999 and Subrata et al., 1996).

In our latest investigation, we replaced part of the vitamin mineral premix by brewer’s yeast in finishing diet and found improved productivity variables (Miazzo et al., 2003, 2004). In another research, broiler received diets deficient in vitamin B6, and a part of them, received the addition of
brewer’s yeast in contrast with the control. The control birds, without B6 and yeast, showed growth diminution and neural disorders (Masse and Weiser, 1994).

If we pay attention to consumer requirement, which demand high protein and low fat values chicken meat (Leclercq, 1998 y Tessaeraud et al., 1999), we believe that brewer’s yeast could fulfill the requirement: a high quality chicken meat. In a preliminary report with Saccharomyces cerevisiae, added at 1.5-6% in broiler diet, lowered the abdominal fat content and improved the productive performance (Onifade et al., 1999).

In the present study the effect of yeast over productive parameters and carcass quality of broilers was investigated.

Materials and methods

One hundred broiler males (Ross) were fed starter ration from one day until 30 days old and finishing ration until 52 days old. At 30 days, the chickens were distributed into 20 pens with five birds per pen and five pens per ration. In all cases, birds received a starter ration with 20.9 % CP and 3,100 Kcal ME/Kg and a finisher ration with 19 % CP and 3,200 Kcal ME/Kg.

The Diets were: 1) Control, commercial type feed with 0.10% premix, without Yeast; 2) Control with 0.05% of premix, without Yeast, 3) Diet 2 with 0.15% Yeast and 4) Diet 2 with 0.30% Yeast.

From 30 to 52 days of age, following parameters were measured: Average Daily Consumption (ADC), Average Daily Gain (ADG) and Conversion Index (CI). At the end of the experiment, two birds per pen (40 chickens) were weighed to obtain carcass performance and killed for cutting and weighing the breast and leg muscles and abdominal fat content.

An ANOVA test was applied to a completely randomized design followed by a Tukey test, significant differences were p ≤ 0.05 (SAS, 2000).

Results and discussion

The results showed that the chickens fed brewer’s yeast, in higher % and replacing vitamin-mineral premix, had significantly higher ADG and better CI but similar ADC. Then, for ADG the addition of probiotic was more pronounced when it was applied to feeds with a higher level where the chickens had 11% more weight gain than the controls and diet with lower premix and 10.8% lower brewer’s yeast level, respectively (p ≤ 0.05). The broilers fed 0.3% yeast were more efficient in CI then the others (p ≤ 0.05).

These results are in agreement with previous studies by Churchil et al (2000), who noticed better weight gain when adding 0.2% of yeast in the poultry diets. In agreement with this, Miazzo et al. (1994, 1995, 1997, 1998, 2000) found an improvement in productivity variables, when adding brewer’s yeast in different levels (0.3-0.9% in a starter ration and 0.5-1% in finisher ration). In our last investigations the parity replacement of premix by brewer’s yeast, in similar levels and in finisher ration, led to improvement the productivity variables (Miazzo et al., 2003 and Nilson et al., 2004). Parly in agreement with this, Masse y Weisser (1994) took away B6 vitamin from the broiler diet (0.6 mg/Kg) and added 2% of brewer’s yeast or nothing, and noticed that the latter birds showed growth diminution and neural disorders.

Yalcin et al (1993) and Yadav et al (1994) also found better weight gain and conversion index in broiler when adding yeast in higher percentages (5-20) than that we used in this experiment. Other researches added brewer’s yeast combined with antibiotics like aureomycin, penicilin, bacitracin and tylosin or probiotics like Bacillus subtilis and found an amelioration in broiler productivity parameters (Subrata et al., 1997; Onifade et al., 1999 and Maiorka et al., 2001).

Breast and leg muscle weight and carcass performance did not differ significantly, but we could see that broilers on Diet 4 had about 10% more breast and leg muscles weight and 9% higher carcass performance, than the other chickens. The chickens fed yeast accumulated significantly (p ≤ 0.05) 12% and 15% less abdominal fat than the others (Diet 1 and 2).

This results are partly in agreement with Onifade et al (1999) who found that the addition of Saccharomyces cerevisiae in 1.5-6% level, lowered the abdominal fat content and improved the productivity.

These results suggest that Saccharomyces cerevisiae could act as a growth promotor, because of it is natural improvement of digestibility and absorption of nutrients and controlling infections by enteric pathogens (Cruickshank 2002).
References


