

# Stimulation of Egg Production in Japanese Quails by Enriching Feed with Residual Yeast

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## Abstract

Quail eggs are more and more approved for consumers because they bring many benefits to the human body. Therefore, quails breeding for eggs production have become a very profitable business. Residual yeast may be a nutritional supplement, especially rich in vitamins and proteins. This article studies the influence of residual beer yeast on egg laying in Japanese quails. In order to be integrated into the diet of quails the yeast has undergone a process of autolysis; its influence has been examined on separate groups. The results were reported as a percentage compared with the control group, where the feed does not contain this supplement. Due to its content rich in vitamins and proteins, the residual beer yeast used in feeding the quails bred for eggs stimulates egg laying.

**Keywords:** autolysis, eggs, food, quail, yeast.

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## 1. Introduction

Beer yeast sediment resulted from the technological process of beer manufacture can be used as raw product or after a preliminary drying in animal feeding, as a component of the feedstuff [1, 2]. So far, I have not found information related to the presence of beer yeast in the feed used for feeding quails (*Coturnix japonica*). Vitamins and trace elements have an impact on the healing power of quail eggs [3]. This study refers to the evolution of eggs production of quails under the influence of the addition of yeast in varied degrees in their feed. The yeast strains are part of the culture collection belonging to the Centre of Research in Biotechnology and Microbiology within the Faculty of Agricultural Sciences, Food Industry and Environment Protection of the Lucian Blaga University of Sibiu. The research was conducted on groups of 50 quails of the same age that were maintained under identical conditions. Eggs production was recorded for 12

weeks and expressed in number of eggs per day and per lot (50 quails).

## 2. Materials and methods

During this study we have used: three strains of yeast of residual beer (*Saccharomyces carlsbergensis* RSCL3, RSCL4, RSCL5) autolysed in such a way, to be fermentative inactive. The autolysis was carried out in an oven at 50°C for 24 hours [2].

The forage used in this study as feed stuff for quails was composed of: corn 20%, barley 11%, wheat 20%, sunflower 12%, soy and calcium 25%, (2% calcium and 23% soy), alfalfa, clover 12%.

Each strain of yeast was added to this fodder ration in proportions of 1%, 3% and 5% (dry weight).

Eggs production was monitored on each batch of 50 quails.

The quails are reared in batteries and they all were 8 weeks at the beginning of the experiment.

The housing for quails provides constant environmental conditions as follows:

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- average temperature: 23,5°C,
- relative air humidity was of 75-80%;
- ventilation was provided both naturally and artificially;
- light was provided on average 18 hours per day both for the control group and the experimental group;
- artificial light intensity was 6 W/m<sup>2</sup>.

Battery monitoring was performed daily on all the lots considered for the study for a period of 92 days. On the first eight days was monitored behavior of feeding quails with new food, then the counting of eggs was made on every two weeks.

### 3. Results and discussion

Yeast autolysates are characterized by a chemical composition similar to the yeast they are derived

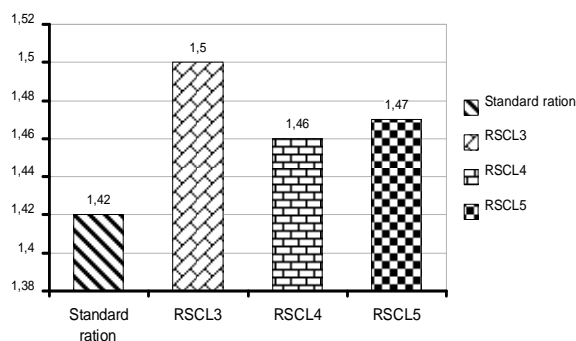
from, which justifies their use in animals forage, especially as a complementary source of nitrogen. The beer yeast is a real concentrate of vitamins from B complex, which are clearly superior to other vegetal or animal derived feedstuff.

According to Balasescu, [4] the experiments proved that the administration of a forage based on chelated microelements, vitamins and zeolites, leads to a production of eggs up to 7,54 % larger than in the case of the administration of a forage containing 1% microelements provided from sodium chlorides and oxides, vitamins and corn meal.

The obtained results concerning the production of quail eggs under the influence of residual autolysed yeast added in different percentage are presented in table 1.

**Table 1.** Eggs production of quails fed with yeast in different percentages

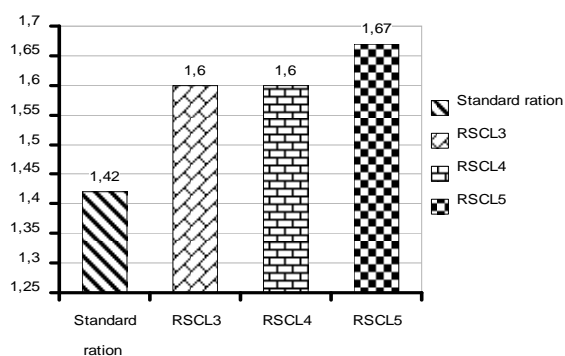
Counting time (on every 2 weeks)	Average number of eggs /day/50 quails (Standard ration)	Average no. of eggs /day/50 quails								
		Addition of autolysed yeast RSCL3			Addition of autolysed yeast RSCL4			Addition of autolysed yeast RSCL5		
		1%	3%	5%	1%	3%	5%	1%	3%	5%
1	68	70	74	87	69	80	92	69	84	94
2	70	74	78	92	72	81	93	71	82	96
3	72	75	77	88	73	79	95	75	81	95
4	69	76	79	91	71	81	97	73	87	93
5	75	79	84	93	78	82	94	78	80	90
6	74	76	88	94	77	79	91	77	88	92
Total	428	450	480	545	440	482	562	443	502	560
Average / day /quail	1.42	1.5	1.6	1.81	1.46	1.6	1.87	1.47	1.67	1.86



**Figure 1.** Evolution of eggs production per day and per quail fed with forage containing 1% autolysed yeast.

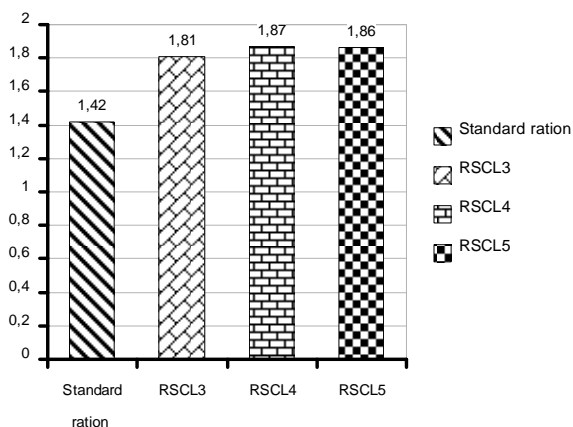
Analyzing table 1 and figure 1 we can notice that for 1% yeast added in the pre-mix used for feeding eggs quails, the largest production of eggs was recorded after 12 weeks in RSCL3 strain.

In the case of the other two strains RSCL5 and RSCL4 added in the premix the eggs production considerably increased as compared to the standard ration.



**Figure 2.** Evolution of eggs production per day and per quail fed with forage containing 3% autolysed yeast.

When adding 3% autolysed yeast we can notice that the production of quail eggs after 12 weeks has increased in the case of RSCL5 strain whereas for RSCL3 and RSCL4 the production of eggs per day and quail is the same (Table 1, Figure 2), but a lot larger as compared to the standard ration.



**Figure 3.** Evolution of eggs production per day and per quail fed with forage containing 5% autolysed yeast.

In the case of the addition of 5% autolysed yeast in standard feed rations of Japanese quail after 12 weeks of eggs laying there was recorded an increase of production for RSCL4 strain (Table 1 and Figure 3).

#### 4. Conclusions

As a result of the study performed we notice that the addition of residual autolysed beer yeast in the premix used for feeding eggs laying quails has a favorable influence on the average number of eggs per day and per quail.

During the period of study, from November 2009 till February 2010, autolysed yeast RSCL4 added in the quails forage mass led to an increase of laying eggs, the growing being express up to 30% compared with normal feedstuff (without yeast). The quality of the forage used for quails feeding is essential; ensuring the health of quails and the number of eggs and their quality depend on the forage composition.

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