The implementation of forced molting technology on rejected laying hens for the people discharged from employment (a case study at Duwet Village, Klaten, Indonesia)[1]

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ABSTRACT: This study was done to prove the added value of forced molting technology on the rejected egg-laying hens and improvement of egg-laying hen rearing technique for the people discharged from employment using training method with the materials of: 1) forced molting technology appplication and 2) egg-laying hen rearing technique. The training methods consisted of 8 sessions of 90 min of theory presentation of and practice of egg-laying hen rearing executed for 4 mo. The trainees were divided into two groups, Karangasem group and Nanggulan group, assigned for rearing 35 hens and 30 hens, respectively. The results of the study show that the Karangasem and Nanggulan trainees' ability regarding with both training materials increased to 105.33% and 21.37% respectively. The hen day average production (HDA) of the laying hens reared by Karangasem and Nanggulan group increased to 35% and 59%, respectively following the application of forced molting technology. The farm business analysis of the forced molting technology application of Karangasem group and Nanggulan group showed the profit of Rp78,863.00 and Rp81,805.00/mo, benefit cost ratio of 1.16 and 1.18, payback period of credit of 19 and 16 mo, and break even point of Rp380,185.00 and Rp327,278.00/mo, respectively. The study concluded that forced molting technology application on the rejected laying hens was able to increase the production and financial added value of egg-laying hen rearing, and at the same time to improve the technical implementation of people discharged from employment.

Key words: forced molting, rejected egg-laying hens, hen-day average, farm business, employment discharged

INTRODUCTION

The decline of textile industry in Indonesia and the global economic crisis currently have impacts towards the textile industry itself and other fields in Surakarta city and surrounding areas. The manpower reduction or people discharged from employment takes place massively, including some of the workers from Wonosari sub-district who are employed in industries in the region of Surakarta and they are categorically apt to poverty.

Wonosari sub-district is territorially a region of Klaten regency. It is located in the most south-eastern part of the regency, and is close the industrial sites of Surakarta. Many of the Wonasari inhabitants work there, including the inhabitants of Duwet village, Wonosari sub-district, Klaten regency. Based on the data obtained from the administrative office of Duwet village, in 2006 there were 871 inhabitants working as labor in the private sector. However, in 2008, their number declined approximately up to 6% or, their number was 818. One of the factors reducing the number of inhabitants working in the private sector was due to discharging from employment. During the years from 2006 to 2008, there were 53 employees from Duwet village discharged from employment. In terms of their latest educational background, 70% of them were graduates of primary schools, and the rest 30% were the graduates of junior secondary school. In terms of sex, 80% was female and 20% was male. Some of them currently are still unemployed.

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This unemployment is potential for bringing about poverty. To deal with such a problem, they require life skills which based on the regional potentials. One of them is achieved through the forced molting technology application on the rejected laying hens. This technology is thought to be applicable and developable as egg-laying hen business with a cheaper investment in Duwet village.

Egg-laying hens are considered economically unviable or unprofitable ones if the production costs (expenditures) are higher than the revenues of their egg sales. They are well-known as rejected egg-laying hens, and their productive period is approximately up to 52 weeks (Rasyaf, 1994). The hen day average of the rejected egg-laying hens, however, can still be rejuvenated with the force molting technology application (Ali-Mursyid and Sariri, 2008; Ali-Mursyid *et al.*, 2008; Ali-Mursyid and Husodo, 2004).

The force molting technology can extend the hen day average period so that the egg-laying hens which enter their unproductive period can still be reproductive (Harimurti *et al.*, 1979) and can be made economically more profitable (Ali-Mursyid, *et al.*, 2008; Brake *et al.*, 1984). The force molting technology is an alternative management applied by the flock business to deal with the declining hen day average, which causes the revenues to be economically unprofitable (Hoyle and Garlich, 1987). The force molting can improve the performance of the egg-laying hens including the egg quality (Harsono, 1989) without shifting the activity of their body immunity (Ali-Mursyid and Sariri, 2008; Alodan and Mashaly, 1999).

Duwet village is one the villages, which is potential for the rejected laying hen-based hen farm development. The prospective rejected laying hens can easily be obtained due to the availability of many centers of hen flocks in Surakarta city, which offer millions of hens. The prospective rejected laying hens for the force molting technology application can also be obtained from Silir chicken market in Surakarta city, which is 15 km away from Duwet village. The egg-laying hen development is also supported by the existence of the poultry shop in Duwet village, which is able to support the production facility for poultry feed materials and veterinary medicine. The production facility of other feed materials such as corn and rice bran is very easy to be found and very cheap. Around Duwet village, there are 6 rice mills, which produce the rice bran and four corn wholesalers. The support capacity for the egg marketing is also fairly high. The potential can be seen from the fairly big number of inhabitants of Duwet village (4007 inhabitants).

This study aims at proving the added value of the force molting technology application to the rejevted laying hens and improving the egg-laying hen rearing technique for those exposed to the employment termination.

MATERIALS AND METHODS

Hens, Feeds, and Cages

This study used 75 rejected laying hens, complete feed with the compositions of yellow corn 50%, and rice bran 15%, and poultry feed concentrate of CP124 35% which is produced by PT. Charoen Phokpand, and individual battery cages.

Management of Forced Molting

The 75 rejected laying hens were distributed to 2 groups of trainees, namely: Karangasem group and Naggulan group. Both groups reared 35 and 30 rejected laying hens respectively. The hens were adapted for one week by administering a complete feed and an *ad libitum* drinking. In Week 2, the hens were exposed to feed fasting for one week (feed fasting period). In Week 3, the hens were fed with yellow corn with an amount of 40g/hen/day for 5 weeks (feed limitation period). During the feed fasting and feed limitation periods, the hens were continuously given drink by the *ad libitum* drinking. From Week 8, the hens were then given a complete feed (egg-laying period) for 10 weeks.

Management of Training

The training was administered to 24 trainees and three village figures of Duwet village, Wonosari sub-district, Klaten regency. The training materials included: (1) Force Molting technology Application, and (2) Egg-Laying Hen Rearing Technique. The training methods consisted of theory presentation of 8 sessions @ 90 minutes and egg-laying hen rearing practicum executed from July 21st to November 25th, 2009. The theory presentation was done through lecturing, discussion, and group presentation. In the practicum of egg-laying hen rearing and the force molting application, the trainees were divided into two groups, namely: Karangasem group and Nanggulan group. The former had 13 trainees and the latter had 14 trainees. During the practicum, all the trainees were scheduled to be actively involved in the egg-laying hen management. The activities during the practicum included mixing the feed, administering the feed and drink, collecting and handling the eggs, observing the egg-laying hens, observing the cage surroundings, and recording all the data of all activities done.

Evaluation Design

The Evaluation of Trainees' Ability. The evaluation of trainees' ability was done through the listed questions which were extended to the trainees prior to (pre-test) and following the practicum (post-test). The items of the questions were arranged in order to find out how well the knowledge and skills of the trainees on the training materials were. The answers to each item were in the multiple choice form; the trainees chose the best answer to each question. The score of each trainee was calculated as follows: Trainee's score = (the number of correct answers : the number of questions) x 100.

Farm Business Evaluation. Based on the daily recording made by the trainees, the Hen Day Average (HDA%) and the feed consumption (g/hen/day) were calculated, and the farm business was analyzed. The farm business analysis was measured in terms of capital, expenditure, revenue, benefit/cost ratio (BCR), pay back period of credit (PPC), and break even point (BEP).

RESULTS AND DISCUSSION

The Ability of Trainees

The training on the force molting technology application for the inhabitants of Duwet village, Wonosari sub-district, Klaten regency exposed to the employment termination and involved in the training as trainees has been significantly successful to improve their ability ($P<0.05$). The result shows that the applied training method and technique were effective. Statistically, the improvement of the trainees' score of the training materials on the force molting technology application ($P = 0.000$) was higher than that of the trainees' score of the training on the egg-laying hen rearing technique ($P = 0.021$), (Table 1).

Table 1. The trainees' score of the training on the force molting technology application based on the training materials and practicum group.

Training material	Group	Score ± SD		Improvement	*P*
		Pre-test	Post-test		
Forced molting technology	Karangasem	37.50 ± 7.54	70.00 ± 20.98	86.67%	0.000
	Nanggulan	30.00 ± 10.54	70.00 ± 13.23	133.33%	0.000
	Total	34.09 ± 9.59	70.00 ± 17.47	105.33%	0.000
Egg-laying hen rearing technique	Karangasem	47.92 ± 10.78	61.36 ± 14.20	28.06%	0.018
	Nanggulan	46.25 ± 13.88	51.56 ± 19.04	11.49%	0.354
	Total	47.16 ± 12.00	57.24 ± 16.58	21.37%	0.021

The curiosity of the trainees towards the training materials on the force molting technology application was high. During the discussion session, they raised more questions on the force molting technology application than on the egg-laying hen rearing technique. The trainees felt that they already mastered the egg-laying hen rearing technique more than the force molting technology

application as proven by their total pre-test score of the egg-laying hen rearing technique which was higher than that of the force molting technology application (47.16 versus 34.09). The rejuvenation of the rejected laying hens was not known by them before so that all of them were very seriously motivated to attend the training, and at the same time they curiously wanted to prove the effectiveness of the force molting technology application. Due to their high motivation towards the force molting technology application, their total pos-test score of the force molting technology application was higher than that of egg-laying hen rearing technique (70.00 versus 57.24).

Based on the comparison of score achieved among Karangasem group and Naggulan group, there has been a tendency difference. Karangasem group's score improvement of the training materials on the force molting technology was lower than Nanggulan group's score improvement of the training materials on the force molting technology (86.67% versus 133.33%), although the score of post-test of both groups was the same. Meanwhile, the score improvement of the training materials on the egg-laying hen rearing technique was reversed; Karangasem group's score improvement was higher than Nanggulan (28.06% versus 11.49%). This indicates that Karangasem group was more successful than Nanggulan group in grasping the training materials on the egg-laying hen rearing technique.

Forced Molting and Egg Production

The application of the force molting technology on the rejected laying hens was able to increase hen day average (HDA); HDA following the treatment was higher than HDA prior to the treatment (Figure 1). The hen day average increased from 30-40% to 50-70%. The result of this study was in line with that of the studies conducted by Ali-Mursyid and Sariri (2008) and Hoyle and Garlich (1987).

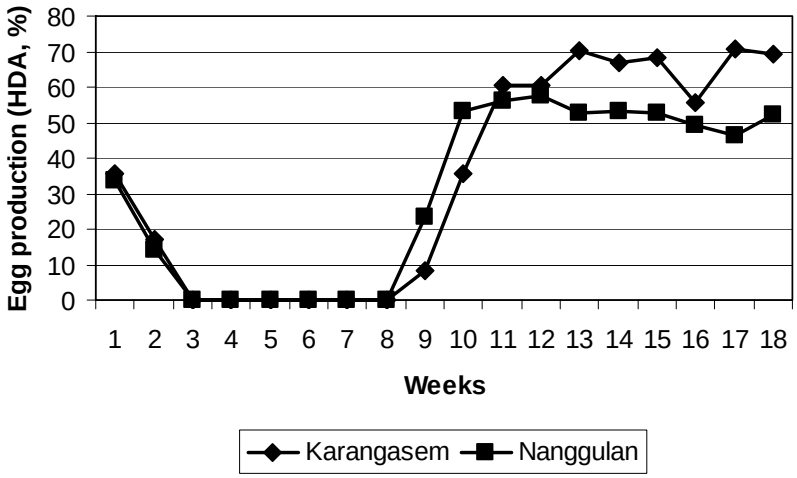

Figure 1. Egg production of the rejected laying hens exposed to the force molting technology

The condition of the lack of nutrients in fasting period (Week 2) and feed limitation (Weeks 3 - 7) caused the hen day average process stopped for five weeks. It had to do with the lack of the energy consumption and the lack of the intake of other nutrients, which made the egg formation hampered (Ali Mursyid and Sariri, 2008). During the hen day average process break, the egg-laying hens underwent refreshing and reproductive organ rejuvenation (Rasyaf, 1994), and then they were able to increase the hen day average following the force molting technology application.

One week following the feed limitation (Week 8), the hens started laying eggs. For Nanggulan group, the hen day average increased sharply up to Week 11, whereas for Karangasem group the hen day average increased sharply up to Week 13. The following weeks after the sharp increase of the hen day average, the egg production tended to be constant, at the level of 69% for Karangasem and at the level of 55% for Nanggulan group. The difference of the hen day average most

like had to do with the discipline of the trainees towards the training schedule made. The trainees of Karangasem group were more active than those of Nanggulan group. This possibly had to do with the main figure of the former group, that is, the chief of Karangasem group was also the chief of *Badan Pertimbangan Desa* (BPD) of Duwet village.

The successfulness of the force molting technology program had to do with the force molting condition of the egg-laying hens in addition to the hen day average break (HDA 0%). One week following the feed fasting, the hens' feathers were molted, but their quantity was small. In Week 2, the hens' feathers were molted in great quantity, and the molting peak was reached in Week 3. In Week 4, the quantity of the molted feathers tended to decrease and in Week 5 the quantity of the molted feathers was very small. At the end of Week 5, the new feathers began to grow. The molted feathers due to the force molting technology application were a response to the condition of lack of nutrients, particularly the protein. The exposure of total fasting for one week, and then administration of the feed with the composition of 40g/hen/day were assumed to only fulfill the need for basal metabolism of the hens. The hens were not able to keep their feathers due to two aspects as follows: the main nutrient required by the feathers was protein (Rasyaf, 1994), and the protein contained by the corns was low (Hartadi *et al.*, 1997).

Farm Business

The result of the farm business analysis shows that the egg-laying hen rearing business of the rejected egg-laying hens exposed to the molting force technology treatment for Karangasem group and Nanggulan group was economically profitable (Table 4). This result was the same as that of a study conducted by Ali-Mursyid *et al.* (2008) in Mukiran village, Kaliwungu sub-district, Semarang regency.

Table 2. The Farm Business Analysis of the force molting technology application on the rearing of 30 *rejected* egg-laying hens

Variable	Karangasem Group	Nanggulan Group
HAD, %	65.30	52.51
Feed administration, g/hen/d	112.05	113.35
Mortality rate, %	10.00	6.67
Capital, Rp	1,318,110.00	1,323,134.00
Expenditure, Rp/mo	437,178.00	448,007.00
Revenue, Rp/mo	584,610,00	528,942.00
Profit, Rp/mo	147,432.00	80,935.00
BCR	1.34	1.18
PPC, mo	8.94	16.35
BEP, Rp/mo	280,037.92	327,999.57

The profits of the farm business of the two groups show that Karangasem group achieved a larger profit than Nanggulan group. This had to do with the difference of their farm business expenditures and revenues. The variable of HDA had a very large effect on the farm business profit of Karangasem group. The fairly high difference in HDA of 12.75% per day was able to increase the revenue of the farm business of Karangasem group amounting to Rp. 55,668.00/month. The difference in feed consumption of 1.5 g/hen/day as a matter of fact was able to reduce the expenditure of the farm business of Karangasem group amounting to Rp10,829.00/month. The feed cost was a cost component with a contribution of 50-70% of the total cost paid for the egg-laying hen rearing (Rasyaf, 1994). Therefore, a slight change in the feed consumption would even influence the cost spent.

The high profit of the farm business of Karangasem group made its payback period of credit 7 month shorter than the actual one, and its break even point of Rp. 47,962.00 was lower than that of Nanggulan group. The variable data of the farm business analysis show that the farm business of Karangasem group was more efficient than that of Nanggulan group.

CONCLUSIONS

The study concluded that the force molting technology application on the rejected laying hens was able to increase the productive and financial added value of the egg-laying hen rearing, and at the same time to improve the technical implementation of the inhabitants exposed to the employment termination.

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