



Effects of Labor Motivation in Poultry Production

■ Author(s)

Alencar M do CB de¹
Nääs IA^{2*}
Gontijo LA³
Salgado DA⁴

¹ Professor, Department of Occupational Therapy and Physiotherapy, University Tuiuti of Paraná.

² Professor, Agricultural Engineering College, State University of Campinas.

³ Professor, PPGEF, Federal University of Santa Catarina

⁴ Doctoral student, Agricultural Engineering College, State University of Campinas.

■ Mail Address

Irenilza Alencar Nääs
Faculdade de Engenharia Agrícola - UNICAMP
Caixa Postal 6011
13.083-970. Campinas, SP, Brasil
Tel: 55 19 3521 1039

E-mail: irenilza@agr.unicamp.br

■ Keywords

Ergonomics, labor motivation, poultry production.

■ Acknowledgments

The authors wish to thank CNPQ for financing this study.

Arrived: July / 2007

Approved: December / 2007

ABSTRACT

Broiler production is a significant economic activity in Brazil, and employs a large number of stockpeople in the integration process. Considering that the stockperson's perception may lead to better performance of his/her tasks and flock handling, this study aimed at verifying possible interactions between poultry productivity and stockperson's perception, emotions, and motivation. The study methodology considered two aspects: qualitative analysis, using Ergonomic Work Analysis, with observational method, and by applying a questionnaire and interview, and classification of the answers into positive relationship and "affection" to the job or negative relationship and "disaffection" to the job; and quantitative analysis, applying the Test of Hypothesis for Comparison of Means both for total flock mortality and Weight Equivalent Index data. Qualitative results showed that the stockpeople were aware that the housing environment causes specific health symptoms, as well as they presented different responses as to flock handling. Quantitative data showed a correlation between reduction of total flock mortality and positive relationship towards the broilers and "affection" to the job, whereas no statistical evidence that the same individuals influenced broiler Weight Equivalent Index was detected.

INTRODUCTION

This research study was carried out with stockpeople employed by the Brazilian poultry integration system. These stockpeople are responsible for taking care of broiler feeding and drinking conditions, opening and closing sidewall curtains, as well as cleaning and house-keeping of the poultry house from chick placement to catching for slaughter. Determined attributes, such as responsibility, sensitivity, perception, initiative, and creativity are required from those professionals in order to ensure good production levels. Their work goal involves achieving optimal bird rearing conditions, and systematic and daily follow-up, including weekends and holidays, of the flock. This type of task is highly dependent on the human attributes described above.

Importing meat markets currently demand the assurance that proper animal welfare was provided during rearing, mainly due to public awareness of reduced floor space provided to the broilers (FAWC, 1992; Bastianelli, 2001; Singh *et al.*, 2001), and sometimes poor housing environment quality to which birds are exposed to. Animal welfare has become a public concern, and it may lead to misconceptions of values and productivity (Heier *et al.*, 2002; Hellmeister *et al.*, 2003; McInerney, 2004). Cransberg *et al.* (2002) studied the influence of labor on the behavior and productivity of broilers, and found that the manner stockpeople moved around the house (speed of movement) was



positively correlated with flock mortality during the first rearing weeks.

Current literature shows that aversive and repulsive management may affect both animal welfare and productivity (Rushen *et al.*, 1999; Breuer *et al.*, 2000; Pajor *et al.*, 2000; Raussi, 2003). There are also indications that, in animal production systems, the fear the animal shows from the stockperson may reduce productivity (Hemsworth *et al.*, 2000; Grandin, 2003). The farmer's perception of bird's health was also studied (Berg, 2001).

Regarding stockpeople's response in poultry production, two aspects need to be taken into account: first, how they feel as to their exposure to the aerial and thermal environment (Nääs *et al.*, 2001; Kirkhorn, 2002; Alencar *et al.*, 2004); and second, also related to working conditions, their sense and perception of the tasks they perform (Vernon, 1974; Sternberg, 2000; Beni *et al.*, 2004). Both these aspects may lead either to their success or failure in work.

Several factors motivate man to work, such as supervision and leadership, in addition to individual motivational characteristics (McColl-Kennedy & Anderson, 2002, 2005). Grossman (2000) suggests that emotions apparently play an important role in the enthusiasm the stockperson develops to perform determined tasks.

This research study aimed at verifying possible interactions between broiler productivity and stockperson's perception, emotion, and motivation in working in poultry production.

METHODOLOGY

This study was carried out in 13 integrated broiler farms located at latitude 25°32'05 S, longitude 49°12'23W, and average altitude 905 m in southern Brazil. The definition of integrated broiler stockperson in this study is an individual person who owns the broiler house, works for a Company under a specific contract (the company supplies day-old chicks, and feed up to the catching for slaughter). This individual works for approximately 4 to 5 hours per day for seven days a week in each broiler house, and gets paid according to final production results of the flock. The sample in this study included stockpeople who had performed these tasks, in direct contact with the birds, for at least for two subsequent years.

Broiler houses were similar, and conventionally designed, with wooden poles, concrete floor covered with wood-shavings litter, open sides with plastic

curtains to regulate the lateral openings, and clay-tiled roof. Although length and width dimensions were slightly different among broiler houses, this variation remained within 10% of the total dimensions. During the first three weeks of broiler growth, houses were heated using a wood-burning stove. Most feeders and drinkers were filled manually, and, after heating was removed (4th week), they were pulled up towards the ceiling. Dimmers were used to control light intensity.

The relationship between the stockperson and the Company usually occurred through regular visits of service people to the farms (weekly basis, in average) to check and to follow up flock status. In general, these visits were short, and the interaction mainly involved the stockperson on duty, when technical instructions were directly conveyed to him/her.

In this specific study, 37 stockpeople were evaluated, and included both genders (46% females and 54% males), with ages between 16 and 51 years of age, education level equivalent to complete elementary school, and 1 to 15 years directly involved in activities inside the broiler house.

A questionnaire was developed to obtain responses related to the stockperson's overall motivation to perform specific tasks, and included questions such as: number of daily flock inspections, number of nightly inspections, specific interactions with birds in the flock, perception of the bird's wellbeing, level of friendly or humane interaction with the broilers, and feelings about the job. The questionnaire was applied to each stockperson in an interview format, and there was room for specific comments about the tasks they performed. The answers were classified according to positive relationships towards the broilers and "affection" towards the job, or not (negative relationship and "disaffection"), according to the job demands and emotions felt by the stockperson.

The nature of this experiment was descriptive and exploratory. Ergonomic Work Analysis (Guérin *et al.*, 1997), which applies task and activity demand analysis through observational method, was used. Video footage was performed inside the poultry houses using a digital video camera for recording the stockpeople' activities. Qualitative results (Guérin *et al.*, 1997) were analyzed after classification by the Test of Hypothesis for the Comparison of Means (THCM), where null hypothesis assumed that total mean mortality was equal to 5.85%, and alternative hypothesis assumed that true mean mortality was lower than 5.85%. Results were then submitted to Weight Equivalent Index (WEI - IEP in Portuguese) analysis, with values varying in three



flocks between 262.91 and 291.20, and mean of 278.14 for the 13 studied farms. The above THCM analysis was applied, and the null hypothesis assumed a mean value of 278.14, while the alternative hypothesis was assumed true mean higher than 278.14. The statistical software Minitab® was used for processing the data.

RESULTS AND DISCUSSION

The results are presented in two steps, first the qualitative, and then the quantitative analysis.

Task qualitative analysis

This analysis considered the stockpeople' answers in the interviews reports, when talking about the environment inside the house. Some issues were stressed by the stockpeople:

"...the strong smell and dust irritates my eyes and throat..." meaning that the dust and the ammonia produced by the litter had a strong smell.

"...the dust makes me sneeze..." meaning that the dust irritated their respiratory system.

"...my sinus is affected..." suggesting that those who already had respiratory problems tended to feel worse when exposed to dust.

In fact, stockpeople were apparently not aware of the respiratory risks that the organic dust and gases may pose, although they generally agreed that the environment inside the houses was very dusty, while they were performing certain reported tasks, such as: revolving the litter and pouring the feed into the manual feeders. Cold-like symptoms associated with sneezing, sore throat, and coughing were described and detected in the evaluated group of stockpeople, mainly during the last two weeks of broiler production.

Similar results were found by Donham *et al.* (1999) and Kirkhorn *et al.* (2002), when describing an asthma-like syndrome affecting respiratory function, as well as nose, eyes and throat irritation in poultry workers.

Still in the qualitative analysis, stockpeople highlighted other concerns related to their tasks, such as:

"...I do not want to kill, and I feel bad when killing the weak chicks..." , here the stockperson feels the culture and religion when eliminating weak day-old chicks.

"...I feel sorry for the weak chicks..." , showing some "affection" to the young bird and suffering for having to carry out this specific task.

"...Is it possible to improve the health of the weak chicks?..." , showing that the stockperson feels uncomfortable with the need to kill the weak chicks.

In the animal welfare movement, there is concern with the awareness of suffering (Dawkins, 1980; Fox, 1994); therefore, it is recommended that the elimination of weak chicks, which is necessary for economic reasons, is carried out in a specific way in order to prevent bird suffering or pain.

In the qualitative analysis of the stockperson's perception on decision making, the following items were brought up:

"...do I lift up the curtains or not?," which is related to the specific decision of how to maintain adequate temperature during hot weather. As the inside temperature is not properly recorded, the decision on the movement of the curtains is merely based on the stockperson's perception. In one situation, the stockperson complained of the Company and of the attitude of a supervisor, showing that he did not feel motivated to work and did not give much attention to this fact, which caused him to make the wrong decision, with consequent increase in mortality.

"...we do our best to keep the chicks well..." , and "...it is normal that they die when they are weak, it is not up to us..." . Here, the first report means that the stockperson is concerned with his/her performance, believing that he/she is able to avoid poor flock performance, while in the second one, the stockperson did not grasp the importance of his/her influence on flock result, neither showed any interest in doing his best in this task.

The fact that some stockpeople perceive specific events and others do not, as pointed out by Beni *et al.* (2004), depends on the characteristics of the event, as well as on the expectations and motivations of each individual. Therefore, the use of adequate instruments to control the environment inside the house may help to decrease the stockperson's stress, and to provide better environmental conditions for the broilers. In addition, the supervisor's motivation is important to change both attitude and behavior towards the understanding of how the stockperson's dedication may lead to better results (Mcoll-Kennedy & Anderson, 2002, 2005); often, training is also essential.

Still considering qualitative analysis, stockperson's emotions must be considered, as differences were detected in the relationship between some stockpeople and the broilers, such as:

"...I love them when they are chicks..." , and "...I sleep inside the house to take better care of them..." .

Attitude is expressed not just by passion or hate, but also by intermediate degrees of emotion (Eagly & Chaiken, 1998; Morin, 2004). The sentences



emphasized the degree of relationship the stockpeople had with the birds, inferring their attitude and behavior towards the flock, which is consistent with Ballone *et al.* (2002), who showed that positive emotions lead to favorable treatment in the occasion of a specific event. In this study, when the stockperson expressed care about the flock, he/she would spend more time checking the rearing conditions, and consequently the flock had better results.

Quantitative analysis

Table 1 shows the association between total mortality and positive relationship of the stockperson towards the broilers and "affection" to his/her job.

Table 1 - Association between total broiler mortality and positive relationship towards the broilers and "affection" for the job (THCM=5.85 vs THCM < 5.85).

Variable	N	Mean	St Dv	Upper limit	T	p-value
M	13	5.32	1.07	5.85	-1.79	0.049

M= total mortality; N= number of farms; St Dv= standard deviation; $\alpha=0.05$

It is observed that total mortality was lower in farms where stockpeople reported a favorable relationship with the birds in the reared flock ($p<0.05$). This result indicates that apparently those who showed the relationships reported above used to visit the houses more often, even during the night, minimizing the risks of deviations from optimal environment. Similar results were found by Jackson & Hackett (2007) and Breuer *et al.* (2003), when studying the improvement of the performance of animals when stockpeople adopted a positive attitude towards handling.

The results below are related to the Weight Equivalent Index (WEI-IEP in Portuguese) using the values, which varied in three flocks between 262.91 and 291.20, and presented mean value of 278.14 for 13 farms. Table 2 shows the association between WEI and the influence of a favorable relationship between the stockperson and the bird.

Table 2 - Association between total Weight Equivalent Index and positive relationship towards the broilers and "affection" for the job (THCM=278.14 vs THCM > 278.14).

Variable	N	Mean	St Dv	Lower limit	Upper limit	p-value
WEI	13	277.20	8.53	272.98	282.35	0.651

(WEI - IEP in Portuguese)= Weight Equivalent Index; N= number of farms; St Dv= standard deviation; $\alpha=0.05$

The experimental results did not show statistical significance of the effect of stockperson's positive relationship and "affection" to his/her job on WEI (the

higher the value, the better the flock productivity). The confidence interval ($\alpha=0.05$) for these data (272.04 - 282.35) includes the value of 278.14. However, this particular result is not conclusive, as the WEI calculation includes other variables in addition to bird mortality.

The overall observed results in this study shows that better care and handling, as well as favorable interactions between the stockperson and the flock, influence total broiler mortality. It also indicates that, during the first weeks of production, when the bird requires intensive management routine, stockperson's motivation to work is important.

CONCLUSION

Positive relationship with the reared broilers and "affection" to the job influenced flock productivity and reduced total mortality, although it did not impact Weight Equivalent Index. Animal welfare needs can be more effectively supplied when the stockperson is trained and motivated to work, especially in terms of handling the flock better.

Further research is needed to obtain a deeper understanding on this subject.

REFERENCES

- Alencar M do CB de, Gontijo LA, Nääs IA. Avaliação dos riscos respiratórios em trabalhadores no setor de produção de frangos de corte. *Revista Brasileira de Ciência Avícola* 2004; 6 (1):23-29.
- Ballone GJ, Neto EP, Ortolani IV. Da emoção à lesão: um guia de Medicina Psicossomática. São Paulo: Manole; 2002.
- Bastianelli DA. Produção de frangos diferenciados na França (Mercado, aspectos organizacionais e regulamentares). *Anais da Conferência APINCO de Ciência e Tecnologia Avícola*; 2001; Campinas, SP. Brasil. Campinas: FACTA; 2001. p. 235-254.
- Beni MD, Bommassar R, Grossele L. *Psicologia e sociologia*. São Paulo: Ed. Paulus, 2004.
- Berg C. Health and welfare in organic poultry production. *Acta Veterinaria* 2001; (Suppl):37-45.
- Breuer K, Hemsworth PH, Coleman GL. The effect of positive or negative handling on the behavioural and physiological responses of nonlactating heifers. *Applied Animal Behaviour Science* 2003; 84:3-22.
- Breuer K Hemsworth PH, Barnett JL, Matthews LR, Coleman GJ. Behavioral response to humans and productivity of commercial dairy cows. *Applied Animal Behaviour Science* 2000; 66:273-288.
- Cransberg PH, Hemsworth PH, Coleman GL. Human factors affecting the behaviour and productivity of commercial broiler chickens. *British Poultry Science* 2000; 41:272-279.



- Coleman GJ, McGregor M, Hemsworth PH, Boyce J, Dowling S. The relationship between beliefs, attitudes and observed behaviours of abattoir personnel in pig industry. *Applied Animal Science* 2003; 1-12.
- Dawkins MS. *Animal suffering: the science of animal welfare*. London: Ed. Chapman and Hall; 1980.
- Donham KJ, Cumro D, Reynolds SJ, Merchant JA. Dose-response relationships between occupational aerosol exposures and cross-drift declines of lung function in poultry workers: recommendations for exposure limits. *Journal of Occupational Medicine* 2000; 42(3): 260-269.
- Eagly AH, Chaiken S. Attitude structure and function. In: Gilbert D, Susan T, Lindzey FG. *The handbook of Social Psychology*. New York: Mc Grall Hill; 1998. p.269-321.
- FAWC. FAWC updates the five freedoms. *Veterinary Record* 1992; 131:357.
- Fox MW. *Farm animals: husbandry, behavior and veterinary practice: viewpoints of a critic*. Baltimore: University Park Press; 1994.
- Grandin T. Transferring results of behavioral research to industry to improve animal welfare on the farm, ranch and the slaughter plant. *Applied Animal Behaviour Science* 2003; 81:215-228.
- Guérin F, Laville A, Daniellou F, Duraffourg J, Kerguelen A. *Compreender o trabalho para transformá-lo: a prática da Ergonomia*. São Paulo: Ed. Edgard Blucher; 1997.
- Grossman RJ. Emotions at work. *Health Forum Journal* 2000; 43:18-22.
- Heier BT, Hogasen HR, Jarp J. Factors associated with mortality in Norwegian broiler flocks. *Preventive Veterinary Medicine* 2002; 53(1-2):147-158.
- Hellmeister FP, Menten JFM, Silva MAN, Coelho AAD, Savino VJM. Efeito de genótipo e do sistema de criação sobre o desempenho de frangos tipo caipira. *Revista Brasileira de Zootecnia* 2003; 32(6 suppl.2):1883-1889.
- Hemsworth PH, Coleman GL, Barnett JL, Borg S. Relationships between human-animal interactions and productivity of commercial dairy cows. *Journal of Animal Science* 2000; 78:2821-2831.
- Jackson KMA, Hackett D. A note: the effect of human handling on heart girth behaviour and milk quality in dairy goats. *Applied Animal Behaviour Science*. In press 2007. Kirkhorn SR. Community and Environmental Health effects of concentrated animal feeding operations. *Minnesota Medicine* 2002; 10:32-36.
- McInerney J. *Animal welfare, economics and policy: report on a study undertaken for the farm & animal health economics*. London: Division of DEFRA; 2004.
- McColl-Kennedy JR, Anderson RD. Impact of leadership style and emotions on subordinate performance. *The Leader Quarterly* 2002; 13:545-559.
- McColl-Kennedy JR, Anderson RD. Subordinate-manager gender combination and perceived leadership style influence on emotions, self-esteem and organizational commitment. *Journal of Business Research* 2005; 58(2):115-125.
- Myers DG, organizador. *Psicologia social*. Rio de Janeiro: Ed. LTC-Livros Técnicos e Científicos Editora; 1999.
- Morin ME. Conference. 10th World Congress on Human Resources Management; 2004; Rio de Janeiro, RJ. Brasil.
- Nääs IA, Baracho MS, Miragliotta M. Condições de qualidade do ar em granjas de produção de frangos de corte. 29º Congresso Brasileiro de Engenharia Agrícola; 2001; Fortaleza: CONBEA; 2001.
- Pajor EA, Rushen J, De Passiélle, AM. Aversion learning techniques to evaluate dairy cattle handling practices. *Applied Animal Science* 2000; 69: 89-102.
- Raussi S. Human-cattle interactions in group housing. *Applied Animal Behaviour Science* 2003; 80:245-262.
- Rushen J, Taylor A, De Passillé AM. Domestic animals' fear of humans and its effect on their welfare. *Applied Animal Science* 1999; 65:285-303.
- Singh CV, Kumar D, Singh YP. Potential usefulness of plumage reducing Naked Neck (Na) gene in poultry production at normal and high ambient temperatures. *World's Poultry Science Journal* 2001; 57(2):127-156.
- Sternberg RJ. *Psicologia cognitiva*. Porto Alegre: Ed. Artmed; 2000.
- Vernon MD. *Percepção e experiência*. São Paulo: Perspectiva; 1974.
- Waiblinger S, Menke C, Coleman G. The relation between attitudes personal characteristics and behaviour of stockpeople and subsequent behavior and production of dairy cows. *Applied Animal Behaviour Science* 2002; 79:195-219.