Crystal L. Feldman

Effects of Parental Influences on Teaching and Imitation Toward
Acquiring an Adequate Diet in Domestic Chickens

Amount Requested: $150

604 East College Avenue
MC Box 399
North Manchester, IN 46962

Phone: (260) 982-5634

Email: CLFeldman@manchester.edu
Abstract

Too few people are intrigued by an animal’s responses to their surroundings, as they are consumed with their own interactions with the environment. How often are the animals that keep our stomachs full, ignored or mistreated because their caretakers are uninformed or simply do not care? For farmers, raising animals for food could be a much easier profession, if scientists were better able to understand and explain the learning behaviors and social feeding interactions of these farm animals. Through the use of different social settings, scientists will be able to better understand the psychological thought and behavioral processes produced as a result of their social upbringing and how it affects their growth rates. Research may also lead to understanding the extent to which animals are able to share knowledge about feeding with others through teaching and imitating. By monitoring the feeding habits of newborn domestic chicks in different social settings, it will be determined who provides the necessary elements for the nutritional survival and growth of chickens.

Introduction

Individuals that live in social groups often acquire information through interactions with other members of the group, and they modify their behavior on the basis of the social contexts in which they find themselves (Caro and Hauser, 1992). When knowledge is not innate, and no bird is born programmed to open every imaginable kind of seed, cognition in animals must inevitably involve learning (Gould, 1994). The information that animals gain from their interactions with other members of their species is likely to pertain to feeding, survival, and reproductive habits. This information will aid in the growth and development of the young and ignorant chicks. When mature chickens find food, their
calling behavior is sensitive to the audience (Hauser, 2000). Sometimes these calls are
deceiving to the audience, drawing them in for reasons other than to share an abundant food
source. Chickens often rely on visual stimulation to correctly identify food sources
(Oxford, 1982). This experiment will help to determine how chicks learn what objects are
edible and which are not, through the use of different understandings provided by their
social settings. To ensure that any learned behavior is not shared with the other groups,
three groups of chicks will be placed in separate cages in which none will see the others.
All groups will be provided with a variety of “food,” including edible and inedible items
and their feeding habits will be recorded.

Methods

One group of 15 chicks will be placed in a cage with a non-parent hen, along with
adequate food consisting of corn meal, wild bird seed, and inedible river pebbles, which
will be replenished twice daily, and a heat lamp for lighting and heat that will remain on
throughout the experiment. This group will be used to determine if feeding habits are
learned through parental imitation. A second group of 15 chicks will be placed in a cage
without a hen, along with the same kinds and amounts of food and lighting. This group
will be studied to determine whether chicks learn through individual trial and error taste
tests or through imitation of other, possibly dominant, chicks. Halfway through the
experiment, 4 weeks, half of each serving of wild bird seed will be dyed with food coloring
and given to the first two groups of birds to determine how they react to different visual
stimulations of the same food.

To allow for flexibility of removal of ill chicks from the study, a third group
consisting of 20 chicks will be separated into 20 different cages in which they will receive
no visual stimulation from other chicks or hens. They will all be provided with adequate lighting. Ten isolated chicks will be provided with the same variety of food that all of the social chicks receive. The control group will consist of the other ten isolated chicks which will be provided with feed consisting simply of corn meal. These last two groups will be used to determine the effects of solitude on feeding habits.

Chicks will be weighed weekly to determine growth rates. Observations of eating habits and feeding skills will also be recorded with a video camera to determine if the chicks’ skills are providing them with adequate diets to maintain stable development. Observations will also be taken to determine how a change in visual stimulations in their food affects their eating habits and weight gain. Averages amongst the weight of each group of chicks should provide evidence of whether learning is occurring.

**Results**

The chicks that are contained with a hen will likely imitate her because she is superior and knows how and what to feed on. The group of chicks without a hen will likely determine how to feed through trial and error feedings that help them to determine what is most energy efficient for their bodies. Others of this group will likely imitate the chicks that appear healthy and strong due to their well-developed feeding habits. Most likely a variety of corn meal and wild bird seed will provide the best diet for the chicks. All chicks in isolated cages will probably be the least healthy because they have no visual stimulation on feeding techniques. The worst case scenario could include chicks that no matter the settings all of the chicks eat anything that is in front of them and gain the same amount of weight. Also observations of feeding habits may all appear to be too similar to decipher a difference.
**Budget**

<table>
<thead>
<tr>
<th>Item Name</th>
<th>Explanation</th>
<th>Supplier and Cost</th>
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</thead>
<tbody>
<tr>
<td>Domestic newborn chicks</td>
<td>Observable subjects</td>
<td>Tractor Supply Co. (TSC) $0.30/chick (50 chicks)= $15</td>
</tr>
<tr>
<td>Chicken feed-corn meal</td>
<td>Maintenance</td>
<td>TSC-$20/50lbs bag</td>
</tr>
<tr>
<td>Chicken feed-wild bird feed</td>
<td>Maintenance</td>
<td>TSC-$10/20lbs bag</td>
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<tr>
<td>Cages</td>
<td>Wood containment</td>
<td>TSC- $55</td>
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<tr>
<td>Heat Lamps</td>
<td>Warmth and Light Source</td>
<td>TSC- $50/5 stand and lamps</td>
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<tr>
<td>Hen</td>
<td>Parental subject</td>
<td>Borrow from neighbor</td>
</tr>
<tr>
<td>Tools</td>
<td>Building cages</td>
<td>Have own</td>
</tr>
<tr>
<td>Weigh scale</td>
<td>Observation equipment</td>
<td>Borrow from chicken house</td>
</tr>
<tr>
<td>Video camera and tape</td>
<td>Observation equipment</td>
<td>Have own</td>
</tr>
<tr>
<td><strong>Total Requested</strong></td>
<td><strong>$150.00</strong></td>
<td></td>
</tr>
</tbody>
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**Literature Cited**


**Time Line**

Projected time needed for set-up, experimentation, data analysis, and final product

Set-up and making cages- 2 weeks

Experimentation- 8 weeks

Data analysis- 2 weeks

Final product- 2 weeks

Total time needed- 14 weeks or 3 ½ months.
May 13, 2004

Dr. Albert A. Williams, Chair  
Manchester Research Foundation  
Biology Department  
Manchester College  
604 East College Avenue  
North Manchester, IN 46962

Dear Dr. Williams,

The research proposal “Effects of Parental Influences on Teaching and Imitation of Acquiring an Adequate Diet in Domestic Chickens” is submitted for consideration of a research grant to the Manchester Research Foundation. This proposed research is important to understanding the social patterns and psychology of animals by observing the feeding behaviors of domestic chickens.

Thank you for your consideration of my proposal and I look forward to potentially executing my research through funding provided by Manchester Research Foundation.

Sincerely,

Undergraduate Student  
Manchester College  
Email: CLFeldman@manchester.edu
CURRICULUM VITAE, MAY 2004

CRYSTAL L. FELDMAN
UNDERGRADUATE STUDENT
MANCHESTER COLLEGE
604 EAST COLLEGE AVENUE, BOX 399
NORTH MANCHESTER, IN 46962
(260) 982-5634
CLFeldman@manchester.edu

EDUCATION

2001-present   Biology Undergraduate  Manchester College

2001  Diploma  Academic Honors  Triton High School

Courses:
Principles of Biology I (2001) and II (2002), Ethnobotany (2003), Comparative

PRESENTATIONS

Growth and Development Patterns of Freshwater Mussels in clear and turgid aquarium
(2002)
Effects of Adult Lymphoblastic Leukemia (2003)

SKILLS

Animal Handling Skills
Ability to Make Clear Observations
Time Management Skills
Organizational Skills

RESEARCH INTERESTS

1. Animal Behavior
2. Social Activity of Animals
3. Animal Psychology
4. Effects of Animals on Ecosystems

SERVICE LEARNING

Volunteer at Fort Wayne Children’s Zoo (2003)
Volunteer at Pritchett Veal Barn
Volunteer at Gibson Chicken House
HONORS


Academic Honors Scholarship 2002-2003