

# Enrichment Value of Door Materials to Caged Laying Hens

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## Abstract

This study aims to test if the type of material that cage doors are made of can provide enrichment, stimulation of the senses and mind, to caged laying hens. Due to space constraints, laying hens are not able to perform natural activities, such as sensory or environmental exploration. More enrichment-oriented cage systems, furnished cages, include a nesting box where a door flap separates the nesting area from the rest of the cage. If this study proves that the type of door material used may provide enrichment value, the door used in furnished cages can provide a dual-use of space separation and enrichment. Three test hens were placed in separate cages, each with two companion birds. The cages had three passageways with three different door materials – acrylic, chain links, and vinyl strips – that the hen could choose to move from cage to cage. The test hens were observed for behavior defined as either function or enrichment.

Analysis is ongoing and results are pending.

## Introduction

Enrichment is a tool that allows animals in captivity to stimulate their behavior, psychological activity, and sensory organs. By providing enrichment to a confined environment, the animals' mental and physiological state are kept active, giving them an improved welfare.

An improved welfare reduces stress in an animal, which ultimately leads to better overall health, better production, and stability. These are all important things for producers and researchers to obtain the best results.

This project will focus on laying hens in caged housing and the possible enrichment different door materials – vinyl strips, chain links, and acrylic doors – can have on laying hens, which could benefit both the poultry industry and the research industry that use unfurnished or furnished cages.



Three door materials used – vinyl strips, chain links, and an acrylic door (Maia, Green 2011)

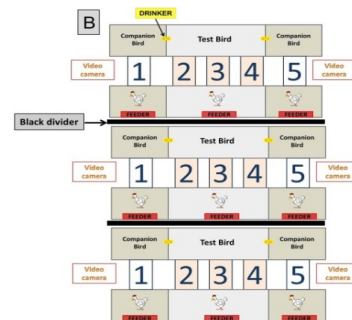
## Aim

My goal of this study is to see if enrichment value can be gained from different door materials, such as vinyl strips, acrylic doors, or chain links. If so, how can this benefit the cage and research industry?

I believe that the type of door material used does in fact have an impact on enrichment, specifically chain links due to the ability to provide audio, physical, and habitat enrichment.

## Method

Three laying hens were used as the test subjects. Each test bird was kept in a separate cage apparatus, with companion birds. The test birds had three doors to move from one side of the cage to the other. The doors were fitted with three types of materials – acrylic, vinyl strips, and chain links.



Cage apparatus, where interaction between each set-up was prevented through black dividers (Maia, Green 2011)

Each test bird had an Acclimation Period, a Training Period, and an Experimental Period. The Experimental Period had three trials for each test bird, in which the three types of doors varied position. The test birds were recorded during each period. For this project, activity from 9AM – 12PM and 6PM – 10:30PM was observed.

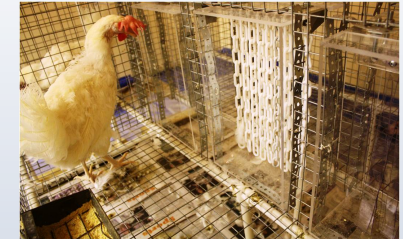
<b>General Function</b>	Walking through door, not looking back or walking back; sitting/sleeping (more than 1 minute)	Walking through door for food		
<b>Social Function</b>	Walking through door, not looking back or walking back; visits companion			
<b>Possible Enrichment</b>	Immediately walks through a different door	Examining door/looking at it (at least 10 seconds)	Walking through door, examining it/looking back at it (at least 10 seconds)	
<b>Clear Enrichment</b>	Stands/sits/sleeps within the tunnel (at least 20 seconds)	Walking through door, immediately pecking at it (within 5 seconds of passage)	Walking through door, immediately walking back through it (within 5 seconds of initial passage)	Pecking at door, but not walking through it (at least 10 seconds)

Figure 1

## Anticipated Results

With the data collected so far, an estimation of results can be made. The graph below represents an estimation of the total of all activity that occurred during all nine trial periods in the Experimental Period.

Bird 1 was determined to be the most active test bird. Because of this, Bird 1 is projected to have the most social and enrichment interactions. Bird 2 was the least active of the test birds, so this bird moved around more for function than enrichment than the other test birds. Bird 3 was projected to be more active than Bird 2, but less active than Bird 3.



### Behaviors and Interactions with Doors

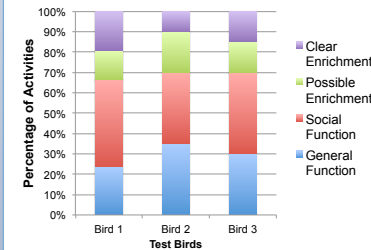


Figure 2

With the data collected so far, the type of door that may provide the most enrichment to laying hens cannot be determined.

## Future Work

I intend to complete the rest of the data set and compare individual door interaction to the Acclimation period data instead of overall door interaction. This should provide a better understanding of any differences in general function behaviors with door interactions. It will also provide indication if one door is providing more enrichment value than others.

## Acknowledgments

I would like to thank Dr. Angela Green for mentoring and providing me with this project. This project would not have occurred without the previous work done by Ana Paula De Assis Maia and the funding provided by the NSF. Thank you to the AWES group for coming together every week for support and motivation.

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