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A WHOLE FARM APPROACH INCORPORATING PASTURE RAISED ORGANIC POULTRY AND A NOVEL CEREAL GRAIN (NAKED OATS) INTO AN ORGANIC ROTATION

NON-TECHNICAL SUMMARY: Many smaller scale organic producers that have a variable product mix are always interested in well designed studies that present them with options for the diversification of their farms. These options can include new rotation options (crops) that may contribute to both the fertility of a given rotation plot as well as provide potential new marketing opportunities. Pasture raised organic broiler chickens are an option for both the fertility and marketing components of the previous statement but this can only realistic if the exorbitant cost of organic poultry diets can be reduced. Naked oats is a husk-less oat variety that is gaining in popularity as an ingredient in multi-grain products for human consumption but is also a potential ingredient for incorporation into organic poultry diets. Naked oats are higher in protein than conventional oats and have an amino acid profile that may reduce the proportion of high cost, high protein supplements that are currently needed to produce balanced organic diets. If our hypothesis is correct and naked oats can be used at up to 70-80% of the diet for pasture reared broilers, this becomes a new option for organic producers. They can produce naked oats for incorporation into their own organic poultry diets, custom grow naked oats for other organic poultry producers, or sell the oats for incorporation into organic multi-grain products for human consumption. One other aspect of the poultry portion of the proposed studies will be a detailed comparison of commercial and heritage strain broiler lines for their suitability to both our pasture rearing system and the strain responses to diets containing a high proportion of naked oats. The other objectives of this multi-year is to quantify the contribution of poultry to the fertility pattern within a given plot and variety testing of different Naked oats cultivars.

OBJECTIVES: If a small organic farm is to be economically and environmentally sustainable, it must incorporate a yearly rotation plan that allows for annual improvements in soil fertility and potential markets for the products generated from each plot within the rotation. Poultry could be raised on one plot within the organic rotation, rotated among plots each year and could be a contributor to both the fertility and product needs stated above. Organic poultry meat production, however, can be problematic due to the extremely high cost of organic feed and/or feedstuffs. This is primarily due to the high amino acid requirements of poultry strains used for meat production and the subsequent need for costly high protein supplements or ingredients. This has led many producers who have certified organic farms to simply market their poultry products as natural or pasture reared on organic farms. Naked oats is a variety of hull-less oats that are higher in protein than conventional oats and have a pattern of amino acids that suggest they could be the primary cereal grain in poultry diets after 3 to 4 weeks of age. In addition to the potential for naked oats to be an ingredient in organic poultry diets, they could also serve as an ingredient in multi-grain products (i.e.

granola) for human consumption, thereby giving organic producers another potential market if they choose to grow naked oats. There are three principle objectives of the current proposal. The first objective is to determine the feasibility of using naked oats as a high percentage of the growing and finishing diets in poultry meat strains. These two diets represent over 70% of the total feed that would be consumed and if our hypothesis is correct, the incorporation of naked oats could represent a significant cost savings to organic producers. The second aspect of the study is to determine the contribution that the yearly rotation of poultry through a plot has on soil fertility. The final objective is to see how our experimental results will translate to organic on farm practice. We have three organic producers who have agreed to utilize our experimental diets and rearing protocol on their own farms to determine the feasibility of incorporating our concepts into commercial organic poultry production.

APPROACH: Organic plots have been identified on the East Badger Organic Farms located at the Ohio Agricultural Research and Development Center. These plots will be divided into a four year rotation that will incorporate Naked Oats, Spelt, and pasture raised poultry as the three components of the yearly rotation plan. The naked oats and poultry rotations will follow or be incorporated into plots with red clover. In the Fall of Year 1, the red clover and spelt will be planted so the whole farming system will be in place by the Spring, 2012. During the fall of 2011, a preliminary experiment will be conducted at the OARDC Poultry Research Farm to determine the maximal level of naked oats that can be incorporated into grower and finisher diets for commercial and heritage broilers that will allow for adequate growth. These experimental levels will range from 60 to 80% inclusion. During the summer of Year 1 (2012), both organic pasture reared and conventional (OARDC Poultry Farm) birds will be fed the experimental diets to determine the contribution of pasture to the fatty acid profiles of muscle and fat samples. In Years 2 and 3, two cycles of birds will be reared on the East Badger organic plots and also on three outside stakeholder farms. The stakeholder farms will receive commercial broilers in Year 2 and heritage broilers in Year 3. Both strains will be represented in the experimental pens located at OARDC in both Years 2 and 3. In Year 4, the birds will only be reared at the East Badger Organic Farm. One important aspect of each year's poultry experiments will be documentation of the time it takes for birds to reach a typical farm market body (6 lbs) and the carcass characteristics of the birds at the time of processing. This will be critical information for organic growers who may want to incorporate our diet (ingredient) strategies and protocol. The poultry data generated at OARDC in the outdoor pasture pens will be analyzed as a one-way analysis of variance using Strain as the main effect tested. The yearly data generated will be shared with potential organic producers via workshops organized by the Small Farm Institute and OEFFA (Ohio Ecological Food and Farm Association) and the eOrganic community of practice for organic agriculture.

PROGRESS: 2011/09 TO 2012/08

OUTPUTS: This project is just beginning as are preliminary experiments. The primary goal of this project is to determine if alternative ingredients and nutritional approaches can be used to successfully rear organic broiler chickens to acceptable market weights without the need for supplemental dietary methionine and with reduced dietary cost. The preliminary experiments are designed to see if a high proportion of naked oats (cereal grain) can be used to replace corn and minimize the level of soybean meal protein supplementation in organic broiler diets. Naked oats has a favorable amino acid profile that could partially offset the need for more expensive protein/amino acid supplements. Diets containing 60 to 80% naked oats will be studied in preliminary experiments before the outdoor, organic experiments are conducted. **PARTICIPANTS:** P.L. Phelan was involved in the design of the rotations that will be used over the course of the project. M. Mariola will integrate the research conducted in the project into his College of Wooster classes on sustainability. **TARGET AUDIENCES:** Organic poultry producers and those interested in organic agricultural products. **PROJECT MODIFICATIONS:** Nothing significant to report during this reporting period.

IMPACT: 2011/09 TO 2012/08

There are no outcomes to be reported at this time.

PUBLICATIONS (not previously reported): 2011/09 TO 2012/08

No publications reported this period

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