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Improving Profitability with On-Farm Feed Manufacturing

By Stuart Boshell

Changing global markets and economics are driving forces behind the need for competitive poultry production in Canada. Feed form in poultry diets has been the topic of research for years with varying results. As feed is the largest input cost to production, it is important to have a strong feed program to be competitive. This involves balanced nutrition and feed presentation. Feed can be in the form of a mash, crumble or pellet. Numerous factors must also be taken into account together with varying complex interactions involved in the feed digestion process. Genetics, behavior, housing conditions, management, health status, costs and profitability must all be considered.

Mash feed is a form of complete feed that is ground and mixed so that birds cannot easily separate out ingredients. Feed that is milled on farm is typically a mash feed. Pelleted feed involves using a finer ground feed that is processed with heat, pressure and added ingredients to bind a pellet together. A crumble is a pellet that has been broken down to a desired size. Making a pellet or crumble diet requires extra specialized processing and equipment that can increase costs.

The current industry practice of using a highly processed pelleted or crumble diet masks the influence of particle size on digestion and production. Particle size on a mash diet for broilers should optimally be between 600 and 800 microns and even higher for layers, particularly when feeding corn[1]. The more uniform the particle size, the better. Uniformity of particle size is key to sustaining intake, digestion and resulting growth. Whole grains are broken or cracked either through a hammer or a roller style mill and proportionally mixed with protein and vitamin mineral sources resulting in a complete ration.

Hammer mills use friction and impact to break down grains. Hammer speed and screen size will dictate particle size and uniformity. A hammer mill can process high volumes of grains at high rates of speed. Roller mills are slower systems that use the friction of two cylinders to break down grains but can provide more uniform particle sizes in lower volumes. Adequate mixing time must also be considered.

Poultry, (birds) historically have been grain eaters and developed a digestive tract to quickly ingest large amounts of feed. The feed is stored in the crop to be treated by lactic acid before going through the proventriculus. In the proventriculus, hydrochloric acid and secretions of pepsin and mucus are increased when feed particle size is increased. From here the feed passes to the gizzard for grinding and predigesting. This process will slow peristaltic motility allowing for better absorption and promoting or stabilizing beneficial intestinal flora. Supplying either digestible or not digestible grit to the bird will allow the gizzard to perform its role with better efficiency.

Coarse limestone is an excellent source of grit and digestible calcium that can be added

to the ration on farm. Coarse limestone inclusion can also decrease phosphorus requirements in the diet by up to 10% over fine limestone.

It has been stated that mash diets permit gradual and more uniform early growth. This allows organ and bone development to support the potential weight gain with fewer leg and physiological problems. Compensatory growth and increased health status will prove to be beneficial on flock performance.

Some studies have shown that birds fed mash diets had a better feed conversion efficiency than those given a pellet [3]. They have also shown that there is no significant differences in live weight gain between birds fed on a mash diet and those given a complete pelleted diet [4]. Other studies have shown an increased feed intake and improved feed conversion on a pelleted or crumble diet.[5] The deciding factor for economic success is to measure the cost per gain.

On Canada's East Coast approximately 1 out of every 5 farms use on farm milling and feed a mash diet. They have calculated an average of $50 savings per ton of mash feed mixed on farm over a bought in complete feed. We see similar savings here in Ontario. On farm milling also allows a producer and his nutritionist to react quicker to changes in flock production where nutritional corrections are required.

In conclusion, balanced nutrition in poultry diets is key to reaching full potential performance. Feeds fed to poultry can come in variable forms with varying results. Good management and attention to details will allow the birds to perform. In today's market place, economics will be the deciding factor as producers are pressured to find more methods to stay competitive.

Current data on mash fed flocks is available from your BSC representative.

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Poultry UPDATE is published in the interest of helping poultry producers become more profitable. We welcome your comments.

BSC Animal Nutrition Inc.
R.R. # 4, St. Marys, Ont. N4X 1C7
Toll Free: 1-800-268-7769
Telephone: 519-349-2190
Fax: 519-349-2191
E-mail: info@bscanimalnutrition.com
Website: www.bscanimalnutrition.com

BSC Representatives

Peter Vingerhoeds 519-229-8810
e-mail: peter@bscanimalnutrition.com

Perth, Wellington, Waterloo, Huron
Stuart Boshell 519-949-0149
e-mail: stuart@bscanimalnutrition.com

Lambton, Middlesex
Ben Dekker 519-899-4769
Fax 519-899-2327
e-mail: dekker@excelco.on.ca

Oxford, Kent, Elgin
Jamie Kuyt 519-269-3319
e-mail : jamie@bscanimalnutrition.com

Ruminant
Colin Pool 519-674-2159
Fax 519-674-2553
(e-mail: southill@ciaccess.com)

Laura Morris (cell) 519-854-3012
(e-mail: laura@bscanimalnutrition.com)