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Opinion

Dietary Supplementation of Medium Chain Fatty Acids in Broiler Chickens

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Efficient production and quality products are the need of present-day modern poultry industry, which is being achieved by modern breeding, quality feed, optimum environmental conditions and stringent biosecurity measures. Moreover, improved gut health is also important as it controls digestion of feed, absorption and metabolism of nutrients. Therefore, maintaining sound gut health with the help of newer feed additives is crucial. Antibiotic growth promoters were supplemented to poultry feed to improve performances and gut health.

However, it may lead to resistance to antibiotics, residues in animal products and environmental contamination and antibiotics are being withdrawn from the poultry diet around the world. The organic compounds having carboxylic groups including short-chain fatty acids such as formic, acetic, propionic and butyric acid and few carboxylic acids such as lactic, malic, tartaric, fumaric, and citric acid are used in poultry feeds. Moreover, the medium chain fatty acids (MCFAs) i.e. caproic acid, caprylic acid, capric acid and lauric acid are also the organic acids and have been found to be more potent bactericidal than the short-chain fatty acids. They are also found to reduce virulence gene expression of Salmonella. They also possess anticoccidial and antiviral effects.

These acids have positive effects on health, production, feed digestibility and lower body fat in broilers and swine. Also, it has been proven that these acids act synergistically if they are used together with other feed additives like prebiotics, probiotics and essential oils.

The bacteriostatic effect of saturated fatty acids (SFA) has been known for many years. The MCFAs have been reported to have antibacterial properties due to their ability to cross membranes of bacteria in un-dissociated form to enter the cytoplasm of the bacterial cell, which suppresses enzymes and nutrient transport systems causing cellular death. The efficacy of organic acids is dependent on its pKa value, which is the pH at which 50% of the acid is dissociated which is improved with increasing chain length and degree of unsaturation. MCFAs are digested and absorbed faster than long-chain fatty acids and may be very useful when the digestion, absorption, or transport of dietary fat is defective.

MCFA lowers the abdominal fat and also increases breast yield in broilers. Thus, there is need to explore the usefulness of MCFA as a safe alternative to antibiotic growth promoters for poultry industry.

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