CHAPTER TWO

2. MECHA0NISM OF ACTION OF ORGANIC ACIDS

The development, maintenance and carrying out any production requires the continuous supply of the animal body with appropriate nutrients each time. Otherwise not only the occurrence of any capacity is weak, but the survival of the organism. The role of nutrition is crucial and this depends, primarily, the success of any effort livestock. In practice, we can not separate from the rest of animal husbandry.

Of all the environmental effects, those due to dietary factors, a cover ranging from 48-70% and sometimes more. The effects of diet on productive properties are both qualitative and quantitative nature. Can still cause a phenotype not respond at all capabilities of the genotypes.

Undoubtedly, the lack and surplus of a nutrient in the diet can cause metabolic disorders. Among the nutrients are relations, which necessarily must know who will compose a diet. To enable the maintenance of the perfect event capabilities genotype, the diet must be complete and balanced. (Katsaounis, Spais 1999).

2.1. A METHOD OF ACTION OF ORGANIC ACIDS

Modern research on the replacement of antibiotic growth additives, with safer and equally effective substances, such as organic acids, has focused on the pig industry and less poultry because of questionable results (Canibe et al.,2001).

The use of organic acids in the diet of pigs and birds requires a detailed knowledge of how their actions. Although several theories have been formulated, the exact mechanism of action of organic acids is not yet fully clarified. Generally considered that organic acids and their salts added to food cause the PH in gastric fluid, resulting in increased activity of proteolytic enzymes to improve digestion and protein. It is also argued that the organic acids cause a reduction of PH-regulatory capacity of feed,

resulting in impaired proliferation and / or colonization of undesirable bacteria in the gastrointestinal tract should also be noted that organic acids may affect the morphological structure of the mucosal bowel, and to stimulate the secretory function of the pancreas. This multifunctional role of organic acids may lead to better digestion and absorption of food nutrients. (Giannenas, 2002).

The protective effect against the feed due to selective inhibition or delay the development of certain strains of bacteria because of the drop caused the PH of the feed and the antimicrobial activity exerted by the dimension form of organic acids. The fall in the price of PH is essential for adequate protein digestion in the stomach of the pig and the stomach flu adenoid. The pepsin activity shows maximum values in PH 2-3,5 but the activity is reduced rapidly when the PH rises above 3.6, while off in PH 6. The products of digestion of proteins and the low PH of intestinal contents in the duodenum is responsible for the stimulation of secretory function of the pancreas and production of enzymes and carbohydrate salts and also play a minor role in regulating the emptying of the stomach. The fall in the price of PH of gastric fluid also prevents the passage of pathogens in the small intestine. An increase in PH of gastric fluid can provide a favorable environment for colonization of the gut and flute especially raffle from mucosal enterotoxin and hemolytic strains, result in inflammation and edema disease in young pigs, especially after weaning.

The theory that reducing the price of the PH of the food by adding organic acids implies a price reduction of PH in the gastrointestinal tract is supported by some researchers and has been questioned by other.

The ability of organic acids to reduce the PH of the food which has added the following order: tartaric> citrate> malate> fumaric> lactic acid> formic> acetic> propionic. The salts of organic acids but have little effect on the PH value of food. The addition of organic acids in feed weaners and pigs fattened pigs improves the apparent digestibility of nutrients and energy. It appears that this effect depends on the type of acid, but the quality is used. Thus, the formic acid was found to influence digestibility of protein, when added to food of very young piglets was high, as does the calcium salt and sodium.

With respect to propionic acid, indicated that this does not affect the digestibility of dry matter and protein diet, nor in absorption of energy in young piglets. Citric acid was not found to influence digestibility of protein and nitrogen retention, although an improvement of digestibility of organic matter and total energy. The fumaric acid was

found to improve the digestibility of organic matter, fat and crude protein and energy food. The lactic acid was found to improve the apparent digestibility of amino acids arginine, phenylalanine, isoleucine, lysine, methionine, histidine, threonine and valine. Believe, that the effect of organic acids on the digestibility of protein and amino acids depends not only on the type of organic acid, but from the age of piglets, and the composition of the raw materials of the diet.

With regard to the effect of organic acids on the absorption and retention of minerals, has found that organic acids enhance the absorption of macro, particularly calcium and phosphorus, and magnesium and calcium and trace elements like zinc, iron, copper and manganese.

The effect of organic acids in the gut microflora is not yet fully explored. Generally, it is argued that the low PH in gastric fluid and the rapid emptying of gastric contents may reduce the growth of bacteria along the gastrointestinal tract. It found that the more acidic PH favors the growth of lactic acid bacteria in the intestine and is a barrier to colonization and growth of the bacterium Escherichia coli.

Also referred that the use of organic acids can reduce the load of coliforms in the gastrointestinal tract and to reduce the occurrence of diarrhea and mortality in piglets. Found, that the addition to food 6-24gr formic acid / Kgr can cause significant reduction in the population of the bacteria Lactobacillus, Bifidobacterium, Eubacterium and Bacteroidaceae in different parts of the bowel. Adding further to food fumaric acid 18 gr / Kgr caused significant reduce the population of the bacteria Lactobacillus, Bifidobacterium and Eubacterium, and microbial flora of the duodenum, the ileum and jejunum. This addition caused also depopulation E. colli jejunum in, but not in other parts of the gastrointestinal tract. In other experiments, however, the addition of citric acid 15 gr / Kgr food had a substantial impact on the population of lactic acid bacteria, the clostridium and E. Colli in the stomach, the jejunum, the ileum or the colon of piglets. In a recent in vitro study found that the presence of coliforms destroyed organic acids (formic, propionic butyric, lactic, benzoic, and fumaric acid) in the low PH of the stomach, while adversely affecting the growth in PH 5 and 7. The strongest antimicrobial activity presented benzoic acid, while the action of organic acids presented increased as the concentration increased. Unlike, the lactic acid bacteria were found to have the ability to proliferate in the acidic PH of the stomach presence of several organic acids (propionic, butyric, lactic, benzoic, fumaric), but not formic acid.

Until now, little is known about the effect of organic acids in the morphological structure of the gut. In the small intestine of piglets weaners decreasing the amount of lottery ticket and increase the depth of secretor, changes that are associated with reduced ability to absorb nutrients. These changes are important, that causes a reduction in the rate of physical growth of pigs and can be partially avoided by providing supplementary feeding piglets suckling or by providing a liquid diet on milk in weaned piglets. The addition also, butyric sodium in diet may cause a significant increase in the number of cells that constitute mikrolachnes bowel and the length of the ileum mikrolachnon developing piglets. The possibility of similar action of other organic acids in the gut mucosa has not been fully explored until now, but it is known that small organic acids carbonic chain produced during the fermentation of carbohydrates by the microbial flora may stimulate the growth of cells in the mucosal epithelium. The excitement generated is higher than butyric acid, less than the propionic acid and yet low in acetic acid.

2.2. METHOD OF ACTION OF ORGANIC ACIDS IN RELATION MONOGASTRIC ANIMALS BY THE BACTERIA

In the mode of action of organic acids in monogastric animals in relation to the bacteria associated with:

- Organic acids entering bacterial cells
- Disorder baseline membrane (leakage, transport mechanisms)
- Inhibition of key metabolic reactions (eg the glykolysis)
- Intracellular stress challenge in homoeostasis of PH (PH normal bacteria ± neutral)
- Accumulation of toxic anions
- Stress reaction in response to the restoration of homoeostasis
- Formation of hydrogen bonds as well as zinc to protect the outer membrane.

The key to the principle mode of action of organic acids in bacteria that are not non-ionized organic acids can penetrate cell walls of bacteria and disrupt the physiology to certain types of bacteria that we call PH-sensitive, meaning that no can tolerate a large internal and external escalation of PH. Among these bacteria have the following Salmonella spp., C. perfringens, Listeria monocytogenes, the Campylobacter spp.

After passive diffusion of organic acids in bacteria, where the PH is slightly above neutral acids will reduce the PH inside the bacteria, leading to situations that would prevent or stop the growth of bacteria.

On the other hand, non-ionic parts of the organic acids that can not escape from the bacteria in their separate form, will accumulate within the bacteria and will disturb many metabolic functions, resulting in increased pressure osmotic, something incompatible with the survival of bacteria.

2.3. METHOD OF ADMINISTRATION OF ORGANIC ACIDS

The high cost of clean, chemically organic acids is a limiting factor for use in animal feed. But there are inexpensive solutions for some of them.

The organic acids are administered to animals with a particular food, but many times the administration may not be effective to the desired degree of, because livestock in some critical periods of life are reduced consumption of food. Thus in young piglets decreased food consumption observed in the period after weaning, showing mainly diarrhea digestive disturbances and impaired retention of nutrients, because the change in diet, from breast milk to solid food. In chickens also reduced food consumption seen in the first days of life chicks, due to the change of diet, the nutrients in the lecithin solid food intake. Furthermore, chicks undergo significant stress during transport from the hatchery to the farm. Sometimes, both in pigs and chickens to reduced food consumption seen in charge of food by mycotoxin in the vaccination period or during the summer, when temperatures are high.

The organic acids, depending on the nature recommended to added to complete feed for pigs and birds, Individually or in combination of two or more, in quantities that can usually ranging from 0,15-1,2%. The formic acid in particular, are recommended to be added to feed for pigs and birds in quantities 0,8-1,0% in 0,6-0,8% propionic acid, fumaric acid and 1,2-1,5% citric acid 2,0-2,5%.

In cases where animals consume less than the expected amount of food, best method of administration of organic acids is the availability of drinking water. This is because healthy animals to consume twice as much water weight in relation to food. When even the animals have a fever or hyperthermia consume even more water. It should be noted

that the addition of organic acids in drinking water, PH of the water should ideally be reduced in price 4. This is because the PH is not the pathogenic bacteria proliferate and furthermore, no reduction in water consumption.

Illustration, for the formic acid required 300-400 ml acid / 1000 Lit of water to reduce the PH value to 4, lactic acid, 1000-1200 ml / 1000 Lit, for acetic acid 2600-2800ml / 1000Lit and the propionic Acid 3000 - 3300 ml / 1000Lit .

2.4. THE USE OF ORGANIC ACIDS IN DIET OF PIGS

The pig is a dynamic sector of animal production worldwide. The way of breeding pigs (intensive farming) led to serious problems in health and performance during breeding, which dealt with the excessive use of antibiotics. As though in recent years the use of antibiotics began to be limited and many countries around the world focusing on the use of alternative antibiotics. Thus the addition of organic acids started to become increasingly frequent in the ration of pigs as they seem to show better results than other animals, as birds and rabbits. (Patten & Waldroup, 1988)

The intensification of pig farming has lead to less time lactation piglets from 5-6 weeks to 3-4 weeks to increase the annual productivity of sows. The period, however, weaning is accompanied by reduced digestion of food because of insufficient production of hydrochloric acid, pancreas enzymes and abrupt changes of composition of diet in relation to breast milk. Note that the hydrochloric acid, which is excreted in the stomach during the operation of digestion, and act as antimicrobial agent, enhancing the protection of digestive tract colonization by pathogenic bacteria. The presence of large quantities of macro and micronutrients in food to meet the needs of young piglets during the weaning period, underlines the problems of insufficient production of hydrochloric acid are commonly used and have a PH-regulatory capacity. Yet, in young piglets, the immune system of the body is low, because the passive immunity the mother responded with colostrums decreases dramatically, whereas active immunity is just starting to develop.

Thus, the weaning age 3-4 weeks out at the pigs and other environmental stresses, often accompanied by reduced food consumption, little or no increase in body weight and in some cases onset of diarrhea and increased mortality. Argued that reducing the price of

the PH of the digestive tract by administration of weak organic acids such as formic. Citric, fumaric, lactic or propionic acid can resolve many of the problems that accompany weaning.

The effect of organic acids such as formic acid and salts of calcium, sodium or potassium, of fumaric acid and citric acid, acetic acid, lactic acid and sorbic acid on performance of weaners piglets has been widely investigated (Kirhgessner et al.1995). Despite the disagreements and contradictions that have been, seems generally organic acids increase the body weight and improve the convertibility of the food index. Note, however, that the stimulative effects of organic acids appear shorter than the growth-promoting antibiotics. The often contradictory findings could be attributed to the large variety of species and quantity of organic acids, composition of food, age and state of health of the animals used in these experiments (Ravindran and Kornegay 1993).

Argued that the effect of organic acids on performance of piglets associated with their action on the appeal of food. Thus, the addition of formic acid in the diet improves the attractiveness of, though in increased quantities to reduce the addition of citric reduces the attractiveness while adding fumaric not appear to affect food consumption. This action must be linked to the age of piglets, since the younger pigs were found to be more sensitive to the presence of organic acids in food. It was reported that piglets had free access to food containing citric and fumaric acid and organic acids without food, consumed significantly greater quantities of food that contained no organic acids. Some organic acids, such as tartaric and formic have a strong odor when increasing the amount of their food can significantly reduce the consumption of food, thereby reducing the growth of body weight. Moreover, adding excessive formate salt in food may cause disturbance of acid-base balance in the body and lead to metabolic acidosis, thus reducing the consumption of food and decreased growth.

When the food consists of grain protein and fruit and herbal substitutes do not contain milk or milk products, the addition of organic acids may improve the performance of piglets (Roth et al. 1993). This is justified by the fact that lactose gives lactic acid in the stomach and small intestine, thus reducing the PH occurs, thus reducing the need for the use of organic acids in food. The reduction is a stimulus for the emptying of the stomach. The benzoic acid can be used to feed pigs or as conservative as organic acid. In experiments used in weaning foods for 2% and the opening of fattening food in proportion 1%. The benzoic acid was detected in significant amounts in the stomach of piglets and in smaller quantities in the small intestine suggesting that benzoic acid is metabolized more

slowly than other organic acids. The addition of benzoic acid in food has resulted in reducing the population of lactic acid bacteria, of lactic acid bacteria and yeasts throughout the gastrointestinal tract. The numbers of coliforms decreased significantly in piglets that consumed the diet with benzoic acid compared to controls. Also, these piglets showed lower prevalence of diarrhea, and had a higher rate of physical growth and a better indicator convertibility compared to controls. Benzoic acid or the salt of calcium has the capacity to reduce the value of PH of urine, resulting in lower emission of ammonia and a lower burden of a microclimate chamber pig.

The addition of potassium in quantity diformikou 1.8% in weaners fed piglets did not significantly affect the value of PH along the gastrointestinal tract, but presented an increased amount of formic acid in the stomach and small intestine. Also, a smaller anaerobic bacterial populations, lactic acid bacteria and yeasts in minutes and colon. The numbers of coliforms did not decline significantly in piglets that consumed the food diformiko potassium compared to controls, but showed a decrease. But other work found that the numbers of coliforms bacteria decreased significantly in piglets that consumed the food diformiko potassium compared with controls.

In fattening pigs, organic acids improve also the apparent digestibility of protein and amino acids, and absorption minerals. These actions have resulted in improved yields and reduced nitrogen and phosphorus excretion in the environment with faeces.

In recent years the breeding of the pig world accepts increased pressure to develop methods for better absorption and assimilation of nitrogen and phosphorus and to reduce its deposit in the environment in order to reduce the phenomenon of eutrophication. The organic acids may be an option for achieving this goal.

To investigate the action of organic acids on the yields of fattened pigs showed that the formic acid and its salts showed better results than those of fumaric acid in an amount when administered 8 g / Kgr food each. Also, lactic acid and salt of butyric acid with sodium had satisfactory effect on the yields of fattened pigs. Clarified however, that the use of increased amount of propionic acid in food has resulted in reducing the rate of weight gain and reduced food intake, possibly because the propionic acid gives the food a characteristic odor.

To investigate the action of organic acids to yield sows is limited. The addition of formic acid in the diet of sows in gestation and lactation did not result in a nutritional status of sows during the gestation period of the cycle-birth-lactation. Also, no significant differences in the size of group, weight of piglets at birth and weight of piglets at

weaning. There were, however, significant differences in health status of sows and considered that the formic acid has antimicrobial properties that prevent the agalaxia syndrome.

In Table 8 we can see about the action of organic acids in the stomach of the pig.

2.5. THE USE OF ORGANIC ACIDS IN NUTRITION OF POULTRY

In poultry production, organic acids have not won the attention and the pig. So far, the addition of organic acids in the ration of the birds on the control of pathogenic bacteria of the gut and improve the operating rate of the food has not been investigated thoroughly as in the case of pork (Waldroup etc.., 1995).

This appears to be due to the proliferation of microorganisms in birds starts from the gizzard and not the stomach or intestine as believed so far today (Spais, 2002).What we want to achieve with oxinisi of feeding the birds, with the addition of organic acids is to accelerate the decline in the PH content of the crop in order to effectively halt the growth of pathogens.

The intestinal bacteria are a constant problem for the breeding of chickens for meat production (Broiler) and laying hens. Intensive farming, the high densities present in poultry that is exacerbating the problem of the emergence of more and more enterobacteria during rearing these. The intestinal bacteria compete with the hens and chickens in terms of available nutrients in food, causing a number of diseases in poultry and poisoning from eating meat on humans. In all countries of the world treated the problem by using increasingly larger amounts of antibiotics leading to a problem as a large number of bacteria have become resistant to antibiotics across sectors. For this reason, have turned to alternative methods of dealing with bacteria in poultry. One way to control pathogenic intestinal bacteria in poultry is the acidification of diets obtained by adding organic acids in them. (Florou-Paneris, 2001).

2.5.1. FOWL MEAT PRODUCTION

The effect of organic acids on the yields of meat hennery has been widely investigated with the following results. The addition of calcium in formic rates 0.5% and 1% resulted in the improvement of body weight of chickens and convertibility of the index of food by 6-8% while rates 1,5-2,5% resulted in the reduction of food consumption and growth of body weight. Other researchers, however (Patten and Waldroup 1988) reported that formic add calcium in food in a quantity of 2% has negatively affected the growth of body mass index and the convertibility of food. Adding acid to food pronionic influenza in 1% resulted in the improvement of the indicator convertibility of food, while more than 2% had a favorable effect.

The addition, however, a mixture of formic and propionic acid in the meat fed hens in rates 0,125-1% did not affect the index of convertibility feeding, mortality, and physical growth and consumption of food. Other researchers such as (Spays 2002) found that adding a mixture of formic and prop ionic acid in the feed rate of influenza in meat 0,4% resulted in the improvement of body weight of chickens and the index of convertibility under commercial feeding conditions, and had no effect when the experiments conducted in laboratory conditions (Panniers -Floor, 2001). These conflicting experimental results, listed in the international literature, could be partly attributed to the type and concentration of organic acids used, but also the health of livestock.

The addition of numeric acid in hens to feed meat to 1 or 1.5% improved the growth of body weight. This favorable effect was attributed to the fact that the numeric acid reduces the total number of bacteria in the small intestine and blind influenza. The addition, again, sorbic acid in food meat hens in quantity up to 2% increased the rate of physical growth and the convertibility index food. This favorable effect was attributed to the fact that organic acids alter the PH in the intestinal tract, activates proteolytic enzymes and alter the composition of intestinal microflora.

The butyric acid has the potential to improve, also the yields of meat hens, when added to food in quantities up to 0.2% in the form of a glycerol ester, which is less bitter taste and smell rancidity compared to net butyric acid (Leeson et al. 2005). The Bolton and Dewar (1965) showed that butyric acid is absorbed rapidly from the gizzard and may not reach the stomach flu, so the beneficial effect may be limited to improvements in diet and reducing the number of microorganisms through the craw.

According to other surveys found that the addition of organic acids in feed chickens for meat production or supply of the water improves the digestibility of food and increase absorption. Also improve water quality, help to better disinfection and cleaning of utensils used for the consumption of food and water. As the addition of organic acids in the ration of the birds seem to diminish the presence of toxic to them but there are clear results of their action is. (Gauer, 2004).

On the other hand, the addition of salts of organic acids in the ration of chickens for meat production, seems to have better results in productive characteristics. For example, the addition of calcium in formats ration of chickens for meat production rates in 1,5-2,5% resulted in a reduction in consumption of food with a concomitant increase but Z.V. influenza, which have better absorption of food and improving the rate of exploitation. More generally, the addition of calcium format in quantities of 3.7% proved that it improves the rate of exploitation of food. According to the research center diet of farm animals in Belgium adding to feed chickens for meat production, a mixture of organic acids (lactic and formats) in combination with butyric sodium resulted in higher weight of chickens at 42 days compared with control by 1.65% and had better results in the control of pathogenic microorganisms in the digestive tract. (Kassis, 2004).

2.5.2. LAYING HENS

The use of organic acids in the diet of laying hens, turkeys for the quail and other species of farmed birds are limited. Several experimental investigations of organic acids added to the ration to a study of productive and qualitative characteristics (change in body weight, laying, egg quality).

In related studies found that organic acids enhance the absorption of phosphorus in hens and meat chickens (Rafacz-Livingston et al. 2005). The organic acids can compete with the acid plant to capture and creation of chemical compounds and micronutrients, thereby releasing the calcium and phosphorus and non-resistant complexes to hydrolysis by endogenous enzymes. Also, organic acids and may enhance the action of phytase granted to improve the absorption of phosphorus.

In one of the studies conducted by (Nikolakaki, J., Ntota, D., 2003) in hens Waren-Isabrown seem that the addition of ration in the mixture of organic acids (fumaric, forms,

and Ortho-lactic acid) at rates of 1 ‰ and 1,5‰ caused no significant effect on body weight of hens and production characteristics of egg.

There were significant differences in the values of PH interventions in faeces were adding acid compared to control.

In breeding hens (Layers) the addition of organic acids has the same effect as above. Much better are the results but where the addition of organic acids is combined with the addition of salt and especially butyric sodium. So in this case the addition of a mixture of organic acids (lactic acid and formats) to 3 ‰ rates in combination with added sodium 500ppm butyric, resulted in the improvement of laying rate and daily egg mass production. It also showed positive results regarding the quality of shell eggs and reduce the number of minutes without the shell affects the color of yolk and their appearance in those spots of blood or faeces (Nollet and others, 2002). According to some researchers, the addition of organic acids in combination with butyric sodium improves the absorption of nutrients in food, while in the case of influenza old seems to have a positive effect on the absorption of calcium and phosphorus thus reducing the desalination bone (Nollet etc.. 2002).

The amount by which the butyric sodium is very important since it appears that when the issue of increasing the 0ppm-500ppm, and rising proportion of the laying hens from 84% in 88%. The audit observed for pathogens in the digestive tract of influenza by adding organic acids in combination with the addition of butyric sodium in various parts of this (duodenum, ileum, jejunum) is very important as shown reduce unwanted microorganisms (E. coli) , while increasing the number of lactic acid bacteria, as butyric sodium is a very good medium to develop them.

This, however, observed in the case of influenza is a clear picture regarding the effect of the addition of organic acids in producing these features. This may be due to different regulatory ability of diets used in the various experiments mentioned above, as well as different strength with which the organic acid in each of them. (Kassis, 2004).

2.6. THE USE OF ORGANIC ACIDS IN NUTRITION OF RABBITS

The rabbits are a branch of animal production has not developed particularly in our country because of the low preference of Greeks for the consumption of meat and the lack of incentives to producers for the development of the sector (Compensatory grants, funding). Yet in many other countries of the world rabbits are highly developed (Italy, China) and where the last years several investigations have been made to replace antibiotics as growth promoters in other products such as organic acids and salts.

Experiments made to race in New Zealand to add to their ration butyric sodium percentages 0.15% and 0.30% showed an improvement in the productive characteristics of rabbits. Specifically, the rabbits which was added sodium butyric showed greater weight gain per week compared with the control, reduction of food consumption rate and better exploitation of food, particularly in the case of butyric sodium used at 0.30% while the case was used at 0.15% the results were hardly encouraging. The improvement of the characteristics of rabbits from the addition of butyric sodium can be explained by a better digestibility of nutrients obtained. Furthermore, butyric sodium percentages 0,30% exercise greater control in the population of unwanted micro-organisms living in the stomach of rabbits (coliform and Cyniclomyces guttulatus) and observed increased galaktovakilous.

The reduction in food consumption observed with the addition of sodium butyric not due to the reduction of food palatability, but to improve the utilization rate of energy from the rabbits, and seems to increase and production of amylase and increase the synthesis of glucose without any change in the number of molecules of ATP. (Kassis, 2004).

CONCLUSIONS

From this work showed that organic acids can be added to the feed for pigs and birds at rates ranging from 0,6-0,8% for formic acid, 0,8-1,0% for propionic acid , 1.2 to 1.5% for fumaric acid and 2,0-2,5% for citric acid. (Mc Donald et al. 2002)

Today, with the restriction of the use of antibiotics for increasing yields of animal, and to prevent diseases, the use of organic acids as feed additives in pig and poultry can be an interesting alternative. However, the effectiveness of the addition of organic acids on performance of pigs and birds is very variant, which may be due to differences in the type and quantity of organic acid addition, the species composition of food and PH-regulating skill, levels of production of volatile fatty acids in some parts of the gut microbial flora in fermentable carbohydrates in the diet, the level of maternal immunity, age of pigs and birds to the existing level of performance, health and welfare, such as density population, ventilation, frequency of cleaning. Although such use constitutes a precautionary measure animal body from the harmful action of certain microbes, similar to that offered by the addition of antibiotics in animal feed, however, preferred because it does not involve antibiotic residues in animal derived products, or creating bacteria resistant to antibiotics.

However, the effect of organic acids on performance of pigs and birds is highly variable and is required to carry out further research studies to better understand the mechanism of action and efficacy. The precise action of organic acids is not fully understood and tested, to explain the effects on growth and health of animals. However some results help to draw conclusions:

1) Reduced levels of microorganisms in the duodenum.

2) Reduced chances of challenging E. Coli.

3) The adaptation of the bacteria associated with the widespread use of organic acids can be characterized as a problem for future work (Canibe et al., 2001).

4) Increase the rate convertibility of food.

5) Reduce the PH feed and digestive system of animals.