Cipher is an inorganic feed acidifier proven to enhance growth performance. By helping to maintain gut integrity, even during stressful rearing conditions, Cipher enables optimal nutrient absorption and improved feed efficiency.

With the growth of antibiotic-free (ABF) poultry production, Cipher has proven to be a suitable alternative due to its ability to minimize bacteria growth on feed, and its beneficial impact on gut health and feed conversion.

Acidification of feed minimizes bacterial growth and promotes good gut health, thereby enhancing the performance of animals. However, not all acidifiers are the same.

**UNDERSTANDING ACIDIFICATION: INORGANIC VS ORGANIC**

Whether organic or inorganic, the strength of an acid is denoted by its pKa value. The lower the pKa value, the stronger the acid, which means it will do a better job at lowering pH. Inorganic acids tend to be stronger acids while organic acids are weaker acids. Organic acids require a higher addition rate to affect pH, which can negatively impact palatability. In addition, safety is a key concern when selecting an acidifier. For example, formic acid is corrosive, hazardous and volatile, and must be encapsulated to be an effective feed acidifier.

<table>
<thead>
<tr>
<th>Acid</th>
<th>pKa Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric Acid</td>
<td>-6.1</td>
</tr>
<tr>
<td>Sodium Bisulfate</td>
<td>1.99</td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>3.08</td>
</tr>
<tr>
<td>Formic Acid</td>
<td>3.75</td>
</tr>
<tr>
<td>Butyric Acid</td>
<td>4.82</td>
</tr>
<tr>
<td>Propionic Acid</td>
<td>4.87</td>
</tr>
</tbody>
</table>

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**Cipher IS DIFFERENT**

As an inorganic (or mineral) acid, Cipher has the ability to effectively lower pH without encapsulation and does not pose any palatability or intake issues that are seen with formate. Plus, it offers formulators additional flexibility. Cipher not only supplies additional sulfur as sulfate for limiting amino acids, it supplies sodium without chloride which will reduce moisture and improve droppings.

**Cipher LOWERS AMMONIA EMISSIONS**

By affecting nitrogen metabolism, Cipher has been shown to reduce ammonia emissions by 15 to 20%.

**Cipher IMPROVES FEED CONVERSION**

Cipher has been shown to significantly improve feed conversion in birds where a disease challenge was present as compared to both disease-challenged and non-disease challenged birds*.

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**Enhanced Performance During Stressful Rearing Conditions**

Cipher works alone, as well as synergistically with ionophores, to aid in optimal nutrient absorption and improved feed efficiency. It has been shown to enhance growth performance by helping maintain gut health during stressful rearing conditions. When fed Cipher, birds subjected to acute heat stress showed improved body weight and feed conversion as compared to ionophores*.

**Inclusion Rates and Instructions**

**Broilers** – 4-8 lbs./ton of feed in all rations

**Turkeys** – 6 lbs./ton of feed in all rations

Research has shown a rate of 4-8 lbs./ton of feed provides the greatest return for the first 28-30 days in broilers. Cipher is recommended for use throughout the grow-out for biological challenges and ammonia control in Cornish hens, small or large birds. A rate of up to 6 lbs./ton through 12 weeks is recommended for turkey toms or hens.

Cipher should be handled like salt. Care should be taken to keep the product dry and equipment should be flushed with grain or meal. The product may be added to the mixer by hand, micro machine, or through the minor ingredient scale.

*Please talk with your Jones-Hamilton representative for a complete copy of the research cited.*