

# PHI-CHROME®

Chromium, described as a response mineral versus a required mineral by the National Research Council (NRC), has demonstrated improved performance and carcass characteristics of poultry fed diets supplemented with organic Cr. Managing stress responses associated with broilers in the final growth stage is critical to maintaining peak performance. As various stress events deplete the body's store of Cr (Anderson, 1994), it becomes important to supplement the diet with organic Cr to replenish these depletions, adding an additional layer of support for the bird.

The impact of supplementing organic Cr in poultry diets has been extensively researched. Research has demonstrated feeding chromium may improve growth performance characteristics, such as increased final body weight (BW), improved feed conversion rate (FCR), and improved feed efficiency (Figure 3). Research also reported improved carcass characteristics such as increased breast yield and decreased carcass fat (Kim et al., 1995, Lien et al., 1999, and Rajalekshmi et al.,

**Figure 3. Summary of Peer-Reviewed Research Focusing on the Impact Cr Supplementation has on Performance and Carcass Characteristics of Poultry**

Response Variables	Response	P-value
<b>Growth Performance</b>		
Intake	Increase	<0.01 & <0.05
Feed Conversion Rate (FCR)	Decrease	<0.01 & <0.05
Body Weight (BW)	Increase	<0.01 & <0.05
<b>Carcass Characteristics</b>		
Carcass Yield	Increase	<0.01 & <0.05
Breast Yield	Increase	<0.05
Abdominal Fat	Decrease	<0.05
Lightness	Increase	<0.05

*A summary of 23 published studies evaluating growth performance, as well as 14 publications evaluating carcass characteristics, with the results and significance reported in Figure 3.*

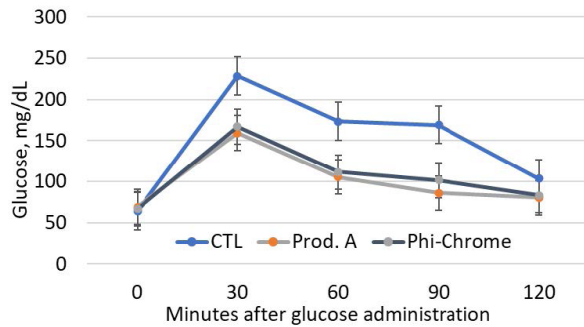


## Understanding the Effects of Chromium Source and Quality in Poultry

Research demonstrates the impact chromium (Cr) may have on metabolic responses. Chromium propionate is a more bioavailable source of Cr and works to help improve insulin sensitivity and promote glucose uptake, which is essential in maintaining normal metabolism of carbohydrates, proteins and lipids (Anderson, 2003). Increased sensitivity to insulin may increase the clearance rate of glucose from the blood, allowing more efficient utilization of energy by the various tissues.

Figure 1 illustrates the blood glucose concentrations after administration of a glucose tolerance test (GTT) following 16 hours of overnight fasting. Both sources of chromium propionate evaluated demonstrated improved glucose utilization by animals supplemented with Cr propionate.

**Figure 1. Blood Glucose Concentrations of Sprague-Dawley Rats with Chromium Propionate in their Diet After Intraperitoneal Glucose Injection (2.0 g/kg BW)**



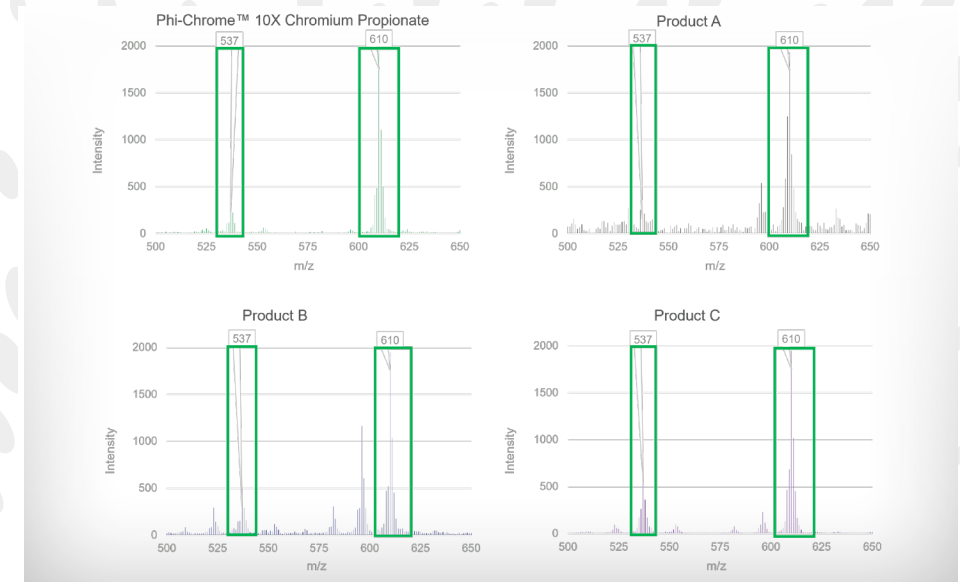
Phibro Animal Health Corporation, 2020

Significance was set at  $P < 0.05$ , with diet ( $P = 0.03$ ) and time ( $P < 0.0001$ ) found to be significantly different versus control. The results indicate Phi-Chrome® and the leading competitive chromium propionate product (Product A) performed similarly when glucose metabolism response was tested.

At Phibro, quality matters at every stage of manufacturing and production. Phi-Chrome chromium propionate 0.4 and 0.04% products are produced in the United States. In combination with decades of manufacturing expertise and our Dynamic Quality Assurance® (DQA®) program, Phibro ensures a high quality, consistent product is delivered to our customers every time.

Time-of-Flight Secondary Ion Mass Spectrometry (TOF-SIMS) data is the primary analysis performed on organic chromium products to identify the target compound using its unique mass. Chromium propionate was confirmed in all samples tested using TOF-SIMS analytical methods.

**Figure 2. TOF-SIMS of Different Chromium Propionate Sources for Identification of Compounds and their Components by Mass**



Eurofins EAG, 2020

Peaks outside the chromium propionate peaks (identified by green boxes) indicate the presence of other compounds. A reduced number of peaks outside the chromium propionate mass were reported in the Phi-Chrome chromium propionate sample. The reduced peaks in Phi-Chrome indicate increased stability and purity for the Phibro chromium propionate product versus the competitive products available in the market.