

■ Vitamins might not share the nutritional spotlight with minerals or protein, but their absence causes diminished results.



VITAMINS:

THE FORGOTTEN COMPONENT

Folks don't often mention vitamins when discussing deer nutrition, but that doesn't mean those compounds aren't important. In fact, they play vital biological roles.

■ by Matt Harper

When watching football, where does your attention focus when the ball is snapped? I'd guess 99 percent of us focus on the quarterback and then the running back or receiver, depending on the ball.

The ball is the focal point because its progress marks the success of a play. Unless you're a broadcaster or played the game, you likely don't think much about the right offensive guard unless he pulls to lead a left sweep. Even if he misses a block, scrutiny only develops during the replay, when the world watches his failure in slow motion. Still, most fans would say the offensive line is fundamental to a team's success. No matter how good the skilled players are, it takes an entire team to win consistently. That might sound like a corporate slogan, but it's true. In fact, I would say it's the rule more than the exception.

The concept of multiple components working together to achieve an outcome can be seen everywhere and in everything. Nutrition provides a perfect example of various parts and pieces combined in exact amounts and ratios to achieve optimal growth and production. Protein is important, but without proper levels of other nutrients, the result is suboptimal. Proper mineral nutrition is critical, but other micro nutrients play a role in balanced nutrition — including vitamins.

The role vitamins play in deer nutrition often falls to the bottom of the list of hot topics. In fact, it typically doesn't make the list. Supplemental vitamins typically find their way into deer nutrition via deer feed, pellets or mineral, none of which promote vitamins as a component. If you asked someone what was in their deer mineral, they might say calcium, salt, copper and other minerals, but few would say vitamins. After all, people call them deer minerals, not deer minerals and vitamins. But although they receive little acknowledgment, vitamins play a vital role nutritionally and biologically.

WHY SUPPLEMENT VITAMINS?

People often debate the need to provide nutritional supplements to wild, free-ranging deer. Through the years, supplemental protein, in the form of food plots or feed supplements, has been recognized as benefiting the nutritional plane of deer. To a lesser degree, mineral supplementation has also become a standard practice. Although vitamins are typically a component of those practices, their importance is seldom discussed. Some argue that supplementation is not necessary for any nutritional component, because deer have survived solely on natural diets since the beginning of their existence. There's no way to argue that, but the question involves deer simply surviving versus maximizing their nutritional health. I've tackled this question several times because it's the basis for supplementation. Growing bigger bucks with larger antlers is the most common objective of improving nutrition. Even folks who scoff at the idea of growing trophy bucks should realize that better nutrition benefits does, fawns and younger bucks, essentially improving the nutritional health of the entire herd. Liken it to human nutrition. We take supplements because our diets are typically deficient in some nutrients. Could we compose a diet that comprises all the essen-

tial nutrition we need in the appropriate amounts? Possibly, but what's the likelihood of that happening every day? So we take supplements to shore up deficiencies. Normal people are not professional athletes who require more and better nutrition to let their bodies perform at high levels. But all deer are athletes, and the better their nutrition, the better the athlete.

WHAT ARE VITAMINS?

Vitamins are defined as any group of organic compounds essential for normal growth and nutrition, and that are required in small quantities in the diet because they cannot be synthesized by the body. Therefore, vitamins are a nutritional requirement because they cannot be produced in sufficiently large quantities by an organism for proper metabolic function. Although vitamins are a relatively recent discovery, people have long been aware of unknown factors derived from food that seemed to help prevent debilitating conditions. Centuries ago, observers realized fresh fruit — especially oranges — could prevent scurvy. That was especially evident on long ocean voyages, where perishable food could not survive long in ships' stores, so diets consisted of limited preserved foods. Sailors didn't know a vitamin C deficiency in their diet was causing scurvy and that fruit provided vitamin C to prevent it. They simply knew that if you ate fruit, you wouldn't experience the condition.

Until the discovery of vitamin chemical compounds, the four dietary components deemed essential were protein, carbohydrates, fat and minerals. However, when scientists discovered that certain conditions such as scurvy were not germ- or disease related but rather appeared to be tied to diet, research began to isolate specific nutritional components responsible for dietary deficiencies. The discovery of vitamins occurred about the turn of the 20th century, when chemical compounds were isolated and recognized as vitamins. In 1912, Casimir Funk coined the word *vitamine*. The first vitamins to be discovered were vitamins A and B1, also known as thiamine.

FAT-SOLUBLE VERSUS WATER-SOLUBLE

Vitamins are classified in two groups based on solubility: fat-soluble or water-soluble. Water-soluble vitamins, as you might expect, are soluble in water and consist of B vitamins, such as thiamin (B1), riboflavin (B2), niacin (B3), pyridoxine (B6) and others. B vitamins serve critical nutritional roles but are typically not supplemented in ruminant diets because they're produced in the rumen via microbial fermentation. Also, vitamin K (which is actually a fat-soluble vitamin) is also produced by microbial activity in the rumen.

Fat-soluble vitamins include vitamins A, D and E, which are also known as antioxidants. Antioxidants help inhibit oxidation, which can produce free radicals, scavenging for electrons and damaging cells. Fat-soluble vitamins are soluble in lipids (fat), and unlike B vitamins can be stored and built up in the body. Vitamins A, D and E cannot be produced in the rumen, so people typically supplement them in ruminants, such as deer.



“THE BETTER THE NUTRITION, THE BETTER THE ATHLETE.”

FUNCTIONS AND DEFICIENCIES OF VITAMINS A, D AND E

The most commonly recognized function of vitamin A (retinol or retinoic acid) is the role it plays in vision — especially night vision. Centuries ago, consuming liver was recognized as a way to improve night vision because of the high amounts of vitamin A in liver. You’ve also heard people say to eat carrots to improve your vision, because carrots contain beta-carotene, which is a precursor to vitamin A. Vitamin A has other functions, including the maintenance of epithelial tissue (skin) and maintenance of mucus membranes, and it’s important in reproduction. Vitamin A also plays a role in bone development and is therefore involved in antler growth. Signs of deficiencies in vitamin A can include blindness, fetal abortions, decreased body weight, abnormal bone growth, increased susceptibility to infections, and rough or poor-quality skin and hair coat. Fawns born to a vitamin A-deficient doe can be weak with a decreased chance of survival.

Vitamin D is most commonly found in vitamin D3 in supplements. Vitamin D has multiple functions, including immunity and bone development. Calcium is the main mineral in antler and bone structures, and vitamin D is involved in the calcium transportation to bones and growing antlers via the blood stream. It’s also important for lactation. Deficiencies in vitamin D often manifest in convulsions, stiff joints, decreased lactation, general weakness, and weakened bone and antler structure.

Vitamin E plays a major role in supporting a healthy immune system and is also important in reproduction. It’s also involved in the control of nerves and muscle contraction, affecting physical movement and internal muscle functions, such as heart, lung and rumen function. The most common symptom of vitamin E deficiency is white muscle disease, which is essentially a form of muscular dystrophy. Other vitamin E deficiencies include depressed immune function, leading to a greater propensity for disease contraction, and reproductive problems in does and bucks, which can lead to lower conception rates.

VITAMIN SUPPLEMENTATION IN DEER

The common form of vitamin supplementation involves including them in a free-choice mineral (mineral/vitamin) or pelleted feed or supplement. As mentioned, vitamins A, D and E are most common in supplementation products, as those vitamins are not produced in adequate quantities to meet full

requirements. Because B vitamins are produced in the rumen, they’re typically not included in deer products or most ruminant products, including cattle minerals and supplements. In high-producing dairy cows, B vitamins are sometimes added to meet extremely high nutritional demand, but in the form of bypass B vitamins, meaning they’re protected and pass through the rumen to the small intestine.

Simply providing vitamins A, D and E in a free-choice mineral doesn’t tell the complete story of proper nutritional supplementation. First, those vitamins must come from high-quality sources. Vitamins can degrade through time, causing decreased efficacy, especially in the presence of minerals. Poor-quality vitamin sources are far more susceptible to degradation. Proper formulation levels are also important, not just in quantity but also in ratios to one another. Quantity and ratios affect maximum digestion and usage by deer.

Whitetail Institute recently introduced the new and innovative Antler Up D3 addition to its Imperial 30-06 and 30-06 Plus Protein products. That’s a perfect example of getting the right levels of vitamins in a product to maximize results. As noted, vitamin D is vital for antler development, as it’s involved in mineral transport, specifically calcium. Researchers at Whitetail Institute developed Antler Up D3 to ensure proper D3 functionality and make sure there are no deficiencies that might lead to decreased antler growth.

SUMMARY

Nutrition is a complex science, and even with the discoveries of the past century, it still involves unknowns. Before vitamins were identified, people simply knew they needed to eat certain foods to avoid various conditions. Researchers of human and animal nutrition will continue to unravel riddles and make discoveries. But it’s important to understand that some nutritional factors, no matter how small, are vital for maximum nutrition. Vitamins might not share the spotlight with minerals or even protein, but their absence causes depressed results. Often, you might not see a vitamin deficiency in a deer herd. But that doesn’t mean it doesn’t exist. If you want to provide the highest level of nutrition to deer, leading to better health and productivity, you must meet all nutritional needs — even small ones.



IMPERIAL WHITETAIL 30-06[®] MINERAL/ VITAMIN SUPPLEMENT

- Delivers essential macro and trace minerals, and vitamins A, D and E, which are needed for a healthy herd and for bucks to reach more of their genetic potential in antler growth. Antler Up D3 increases calcium and phosphorus uptake to promote growth and development of antlers. Promotes heavier body weights and improves the overall health of deer.

