

ZMA

ESSENTIALS

SUPPLEMENT
SPOTLIGHT

Wake up to the benefits of a supplement once popularized as a sleep aid, and strength gains, muscle growth, fat loss and a boost to your health and well-being could be yours

BY JIM STOPPANI, PHD
SENIOR SCIENCE EDITOR

If you've been bodybuilding for more than a decade, you will likely remember the hype that surrounded a simple supplement known as ZMA at the turn of the millennium. A combination of zinc and magnesium aspartate plus vitamin B₆, ZMA was crowded out of the picture by supplements like creatine and nitric oxide boosters, which took off in popularity at around the same time.

And yet, we at FLEX never lost sight of the promise of ZMA. Backed up by clinical research that shows it to be an effective supplement for bodybuilders and other athletes, we have consistently recommended ZMA supplementation. In fact, this simple combination of essential minerals remains on our top 10 list of supplements for bodybuilders. Read on to understand why you need to give ZMA a place in your supplement regimen and how you can maximize its effects.

MAGNIFICENT MINERALS Zinc is an essential mineral and an antioxidant that stimulates the activity of many enzymes in the body, which are critical for a multitude of biochemical reactions. Zinc is critical for protein

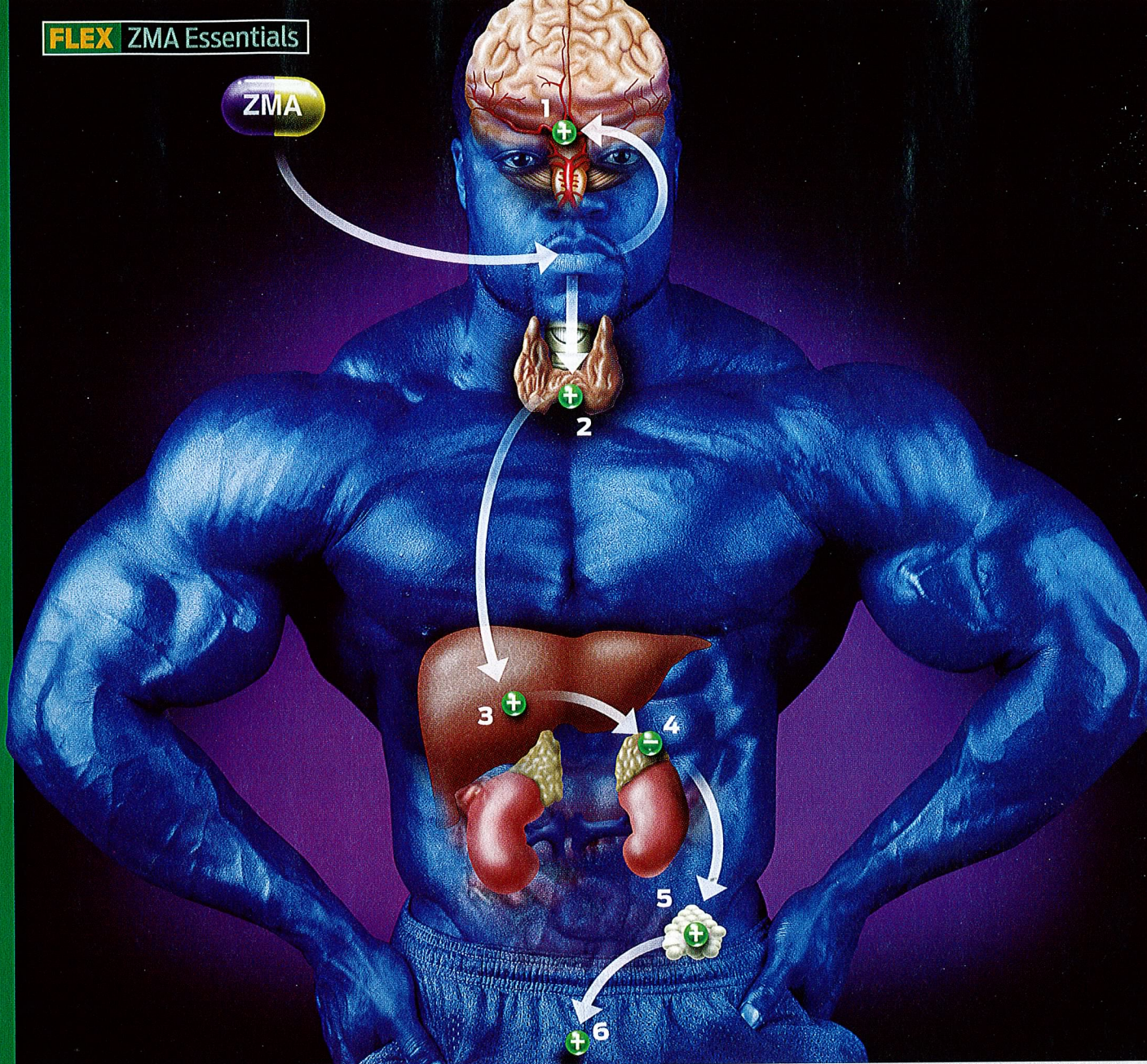
synthesis (the molecular mechanism of muscle growth) and tissue repair after injury. Like zinc, magnesium is an essential mineral also involved in numerous enzymatic reactions in the body. Magnesium is important for cardiovascular, metabolic and bone health.

These two minerals offer a multitude of physique benefits for bodybuilders. A plethora of research shows how zinc and magnesium enhance muscle mass, strength gains and fat loss, not to mention overall health and well-being.

ANABOLIC SUPPORT The most well-known research on ZMA's anabolic benefits was a 2000 study performed at Western Washington University (Bellingham). The researchers had NCAA football players take ZMA or a placebo nightly during an eight-week spring-training program. They discovered that the athletes taking the ZMA supplement experienced a greater than 30% increase in both free and total testosterone levels, and about a 4% increase in insulinlike growth factor-I levels, while those taking a placebo had a 10% decrease

in both free and total testosterone levels and a 22% decrease in IGF-I. In addition to improvements in anabolic hormone levels and sleep quality, the ZMA athletes made significantly greater gains in strength and power compared to the placebo group. These benefits occurred despite the fact that analysis of the athletes' diets found that they were all consuming well over the recommended intake for zinc.

Besides the Western Washington study, several others also find that zinc and magnesium offer potent anabolic properties. The most recent, a 2007 study from Selcuk University (Konya, Turkey) reported that four weeks of zinc supplementation in men increased both free and total testosterone levels at rest and after exercise. The same researchers found similar results for zinc supplementation on testosterone levels in an earlier study with competitive wrestlers. Researchers from the U.S. Department of Agriculture reported that zinc depletion decreased muscle endurance in the lower and upper body of subjects. This means that maintaining zinc levels is critical



ZMA: THE HORMONE HELPER

ZMA goes right to work upon ingestion, enhancing your body's hormonal milieu.

1) Because the magnesium in ZMA enhances sleep quality, it can help influence the pituitary gland (located at the base of the brain) to release more growth hormone (GH) while you sleep. Growth hormone is not only critical for influencing muscle growth but for freeing up fat from fat cells. That means the bodyfat you have stored can travel to metabolic tissue, like muscle, where it gets burned as fuel.

2) The zinc in ZMA can keep your metabolic rate up and bodyfat down by

keeping your levels of thyroid hormone maxed. Thyroid hormone is important for helping you burn more calories and fat throughout the day.

3) ZMA boosts the release of insulinlike growth factor-I from the liver. From the liver, IGF-I travels to the muscles, where it enhances muscle growth. ZMA is one of only a few supplements with research that supports its ability to boost IGF-I levels.

4) ZMA can keep you more anabolic by blunting the release of the catabolic hormone cortisol from the adrenal glands. Cortisol competes with

testosterone to decrease its anabolic actions. By keeping cortisol lower, you maximize testosterone's anabolic effects, which means more strength, more growth, and less fat.

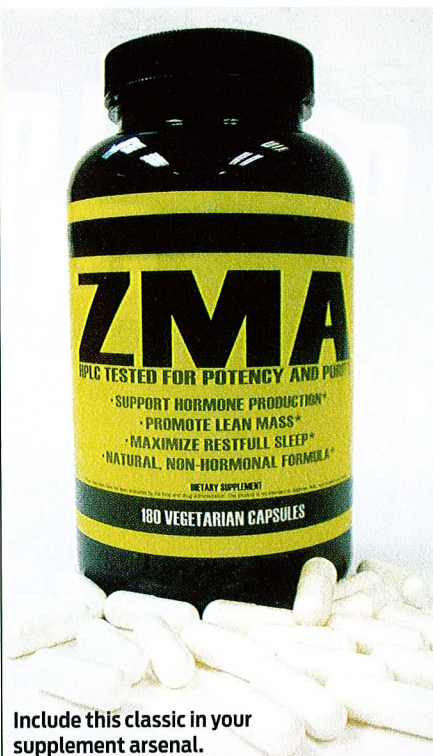
5) ZMA further helps to keep you lean by enhancing leptin release from fat cells. Leptin helps to increase your metabolic rate and decrease your hunger.

6) ZMA helps to maximize muscle strength and growth by keeping both total testosterone and free testosterone levels high. Do we even need to explain why that is important to a bodybuilder?

for your ability to complete a number of reps with a given weight, especially during a workout consisting of multiple sets. As far as magnesium goes, the Western Washington University researchers discovered in an earlier study that subjects taking a magnesium supplement while following a seven-week leg-training program increased their leg strength by 20% more than those taking a placebo.

Both zinc and magnesium supplements have been shown to significantly decrease the levels of the catabolic hormone cortisol. A study by researchers at Justus Liebig University (Giessen, Germany) revealed that triathletes taking a magnesium supplement for four weeks had significantly lower cortisol levels at rest and after a triathlon, as compared to athletes taking a placebo. Brazilian researchers also reported that subjects given a single dose of zinc experienced a significant drop in blood cortisol levels within two hours. Keeping cortisol lowered can be critical for muscle growth and strength gains, as cortisol competes with testosterone, decreasing anabolism and enhancing muscle breakdown.

In addition to boosting testosterone and IGF-I and blunting cortisol, ZMA may also indirectly enhance



Include this classic in your supplement arsenal.

growth hormone levels. ZMA aids sleep quality because magnesium can normalize and extend stage 3 and 4 slow-wave sleep. This is critical, as deeper sleep can help to raise GH levels, which peak during the night. Better sleep quality also aids muscle recovery from tough workouts.

METABOLIC SUPPORT Zinc is critical for maintaining thyroid hormone pro-

duction. This is important for keeping your metabolic rate (amount of calories you burn each day) up. Being low in zinc can interfere with thyroid hormone production — and compromised thyroid hormone function leads to a lower metabolic rate, which makes it harder to drop bodyfat.

Research confirms that when your diet is low in zinc, levels of thyroid hormones fall and resting metabolic rate drops. One study from the University of Massachusetts (Amherst) found that subjects placed on a low-zinc diet had significantly lowered metabolic rates. When they took a zinc supplement (25 milligrams) for 20 days, their metabolism bumped up to levels higher than they had been before they followed the low-zinc diet. The Selcuk University studies also showed that four weeks of zinc supplementation increased thyroid hormone levels in male wrestlers and sedentary men.

Zinc is not only critical for thyroid function, but it appears that it supports levels of the hormone leptin. This hormone is also important for maintaining metabolic rate, as well as keeping hunger down. A recent study from Andong National University (South Korea) showed that zinc deficiency significantly lowered amounts of leptin.

TAKE YOUR MINERALS

Given that zinc and magnesium offer a multitude of benefits that ultimately lead to greater muscle growth and strength gains, and given that you're likely deficient in zinc and magnesium, there's no arguing whether or not you need to supplement with a ZMA product. The only question is how to do so for maximum effect. Follow these rules and you'll be guaranteed to reap all the benefits this mighty mineral combination offers.

■ **RULE #1: Form** Sure, you could try the cheaper route and take stand-alone zinc and magnesium supplements. But you'll likely miss out on all the benefits that getting these minerals in the form of ZMA offers. The form of zinc and magnesium used in ZMA is a chelate known as zinc and magnesium aspartate. This form helps to minimize interference in the absorption of both these minerals. Furthermore, patented ZMA provides the zinc and magnesium aspartate in the proper dosing that is shown to work, as well as the proper amount of B₆, to aid zinc and magnesium absorption by the body.

■ **RULE #2: Timing** One of the most important aspects of supplementing with ZMA is timing. FLEX has always recommended taking it about an hour before bed, as this will

help to maximize its uptake and utilization, as confirmed by clinical research. Taking ZMA at this time of day will also enhance sleep quality.

■ **RULE #3: Combining** Do not take ZMA with food. Both zinc and magnesium are poorly absorbed when consumed with food, as many nutrients can inhibit their absorption and utilization. Therefore, your best bet is to take ZMA about an hour or two after your last meal (about an hour before bed). We do suggest you consider taking one thing with ZMA: arginine or other NO boosters (without caffeine). That's because nitric oxide helps free up zinc in the body so that the mineral can perform its work.

■ **RULE #4: Dose** The proper dose of ZMA is 30 mg of zinc, 450 mg of magnesium, and 10½ mg of B₆, no more, no less. Clinical research found that this dose produced positive effects in athletes' hormone and strength levels. In addition, taking in too much zinc (above 50 mg of absorbed zinc) can lead to negative effects on the immune system, may compromise metabolic status and adversely impact muscle growth and recovery, as well as reduce levels of HDL (good) cholesterol. Getting in much more than 450 mg of magnesium can actually interfere with optimal sleep.

Günter Schlierkamp knows that the ZMA he just swallowed will increase testosterone and growth hormone levels.



IMMUNE SUPPORT Zinc is well known to be critical for immune function, as it affects multiple aspects of the immune system. Research confirms that the incidence of acute lower respiratory tract infections decrease significantly following zinc supplementation. Zinc also has been found to significantly reduce the duration of fever and severity of pneumonia and other serious lower respiratory infections. Research from the Cleveland Clinic (Ohio) has shown that the length and severity of colds were cut in half for subjects receiving zinc at the onset of the illness. The researchers speculated that zinc may block the cold virus from combining with surface proteins that trigger symptoms.

Zinc also functions as an antioxidant. It not only activates an enzyme that helps to prevent diabetes, but also fights cancer by activating the

tumor-suppressor endostatin, and it fights HIV by rendering inactive a protease essential for the HIV virus. In a nutshell, zinc's antioxidant properties will not only enhance your health, but your recovery after workouts. In addition, its immune-promoting effects will help to keep you healthy and in the gym so you can keep going and growing.

ARE YOU DEFICIENT? As early as 1981, research confirmed that athletes are often deficient in zinc and magnesium. This may be due to several factors, such as lost zinc in sweat during training, increased use of zinc for recovery and protein synthesis following training, as well as greater loss of zinc in urine. In addition, there are dietary factors to consider. For example, refined sugars and white-flour products (such as white bread) lower blood levels of zinc and magnesium. Foods rich in

calcium (as found in dairy products) inhibit absorption of both zinc and magnesium by the small intestines. Copper, as well as foods rich in phytates (phosphorous compounds found in whole-grain breads, cereals, and legumes) also hinder the absorption of zinc by the small intestines. Alcohol, too, decreases the absorption of zinc and magnesium and increases their loss through urine.

Given the fact that you likely are not adequately absorbing the zinc from your whole foods and that you are losing copious amounts of the zinc you do absorb, you should seriously consider taking a ZMA supplement to maximize muscle mass and strength gains. Check out the "Take Your Minerals" sidebar for guidelines on taking ZMA for maximal results. **FLEX**