Protein Synthesis & Hormones

Applied Protocols
GOALS

• To increase Lean Body Mass by enhancing protein synthesis

• This is dependent on...
  – Energy Availability
  – Nutrient availability
  – An anabolic Hormonal environment

We Will Cover...

• Macronutrients

• Hormones
  – Insulin/Cortisol
  – GH
  – T/E
  – Inflammation
  – Sleep

• Summary
### Macronutrients and Protein Synthesis

- Amino acids regulate protein synthesis

<table>
<thead>
<tr>
<th>Decreased Protein intake</th>
<th>Decreases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Protein intake</td>
<td>Increases</td>
</tr>
<tr>
<td>Decreased energy intake</td>
<td>Decreases</td>
</tr>
<tr>
<td>Increase cellular hydration</td>
<td>Increases</td>
</tr>
<tr>
<td>Increase leucine in presence of other aminos</td>
<td>Increases</td>
</tr>
<tr>
<td>Increased intake of glutamine in presence of other aminos</td>
<td>Increases</td>
</tr>
</tbody>
</table>
Protein

• “Of great importance”

• Roles; building blocks

• Nitrogen retention; protein synthesis

• Protein synthesis (PS) Protein degradation (PD) PS > PD to increase muscle
Protein Requirements

• 2.2-3.5g / kg
• Divided doses
• Use more when required to facilitate recovery
• Use less when required to allow more room for other macro-nutrients
• ‘Flexing’ macro nutrients – key principle of effective performance nutrition
Leucine

• Triggers mTOR; = mammalian target of rapamycin
• Works with other aminos – not alone
• Works with raised levels of EAAs and BCAAs
• Plus high level of protein intake from food

• Aminos impact on macronutrient metabolism in many ways
• Activation of mTOR in conjunction with insulin enhancement = protein synthesis
Carbohydrates

- Body Fat dependent
- Assist with Insulin Release
- Protein synthesis
- Most misunderstood macro-nutrient
- Functional nature must be understood

- GI and GL
- Acidity
- Grains and allergies
- Refined sugars post and during training only
- Misuse will suppress immune function
- Misuse will alter hormone production
Protein Synthesis

(Rasmussen, et al. 2000)
Principle

- Flexing Macro Nutrients is key to recovery, performance and health
- Think about what you are about to do
- Think about what you’ve just done
- Apply this in context to your performance goals
<table>
<thead>
<tr>
<th>MEAL 1 = PROTEIN PULSE</th>
<th>350g / 4 = 87.5g Approx 3 palms of protein 300g or 8/9oz of protein in total weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOST CATABOLIC TIME</td>
<td>EXCESS STRESS HORMONE - IMMUNE</td>
</tr>
<tr>
<td>SNACK</td>
<td>43.25g Protein – Post training shake with aminos</td>
</tr>
<tr>
<td>MEAL 2 = PROTEIN PULSE</td>
<td>87.5g Protein Approx 3 palms of protein 300g or 8/9oz of protein in total weight</td>
</tr>
<tr>
<td>POST TRAINING WINDOW</td>
<td></td>
</tr>
<tr>
<td>SNACK</td>
<td>43.25g Protein – Post training shake with aminos If double session – or real food</td>
</tr>
<tr>
<td>MEAL 3 = PROTEIN PULSE</td>
<td>87.5g Example 3 salmon steaks</td>
</tr>
<tr>
<td>SNACK 1</td>
<td>43.25g Protein Pot cottage cheese = 25g</td>
</tr>
<tr>
<td>SNACK 2</td>
<td>Night time aminos = 25g</td>
</tr>
</tbody>
</table>
# Fat Loss Grams Per Day

## Start With Half Your Protein Requirements

- e.g. 350 / 2 = 175g per day

## Use More When Required

- e.g. pre-match and post match.

- Or when feeling tired

## Protein Sources

- Bread = 15g
- Banana = 25g
- Apple = 15g
- Fist of rice = 25g
- Baked potato = 20-25g
- 2kg asparagus = 25g
- 200g broccoli = 10g
- 500ml Sports Drink = 50g

## Meal 1

**15g = bag of spinach or 1 piece of fruit**

## Keep Carbs Low Pre Training For Maximum Fat Loss

<table>
<thead>
<tr>
<th>Meal 2</th>
<th>Use Pre Training Aminos For Maximum Fat Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>15g or less Aminos Pre Training</td>
<td></td>
</tr>
<tr>
<td>Post Training 1 = 0.4g / kg CHO = 40g for 100kg player</td>
<td>Recover Aggressively After Each Session</td>
</tr>
<tr>
<td>Post Training 2 = 40g Use recovery matrix to adjust amounts</td>
<td>These Can Be Swapped According To The Days Training</td>
</tr>
</tbody>
</table>

## Meal 3

**40g**

Sweet potato

200g green veggies

Extend the recovery window according to intensity of training

## Meal 4

**25g**

400g green veggies

Eat low carbs at night for maximum hormone release and fat loss
## Fat Grams Per Day

<table>
<thead>
<tr>
<th>No Less than your body weight in kg/g</th>
<th>2 x Eggs, 4 x bacon, spinach and coconut oil</th>
<th>21g from bacon, only 8g sats – 12g from eggs – 3.4 sats</th>
</tr>
</thead>
<tbody>
<tr>
<td>So a 100kg athlete should consume no less than 100g of fat per day</td>
<td>Nuts and a protein shake</td>
<td></td>
</tr>
<tr>
<td>Consuming 100g+ of fat per day is associated with higher T levels, &amp; strength</td>
<td>Keep fat lower in post training nutrition</td>
<td></td>
</tr>
<tr>
<td>Recent research suggests higher cholesterol levels are associated with higher levels of strength</td>
<td>Post training – aim to eat foods high in animal fats, salmon, sardines, pork, beef, lamb</td>
<td></td>
</tr>
<tr>
<td>Cholesterol is the building block for ALL steroid hormones</td>
<td>Keep fat intake from mono, and poly in the main part</td>
<td>Nuts, avocado, olive oil, olives, fish oils, oily fish, lean meats, chicken, turkey, game and coconut oil</td>
</tr>
<tr>
<td>PROTEIN</td>
<td>CARBOHYDRATE</td>
<td>FAT</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>HIGH</td>
<td>LOW</td>
<td>HIGH</td>
</tr>
<tr>
<td>HIGH</td>
<td>LOW</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>LOW / USE AMINOS</td>
<td>HIGH DURING / AFTER</td>
<td>LOW</td>
</tr>
<tr>
<td>TRAINING WINDOW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIGH</td>
<td>HIGH</td>
<td>LOW</td>
</tr>
<tr>
<td>HIGH</td>
<td>HIGH</td>
<td>LOW / MEDIUM</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>LOW</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>
# A Ready Made Regenerate System

http://sportsnutritionvlog.com/regenerate/

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adds 10kg of lean mass in 12 weeks</td>
<td>Protein synthesis</td>
</tr>
<tr>
<td>Uses 2 week phases which build</td>
<td>Cell Volumising</td>
</tr>
<tr>
<td>Each 2 weeks a new phase is introduced</td>
<td>GH Release</td>
</tr>
<tr>
<td>By phase 6 all 6 phases run concurrently</td>
<td>Immune / recovery &amp; Injury</td>
</tr>
<tr>
<td></td>
<td>Hormonal Manipulation</td>
</tr>
<tr>
<td></td>
<td>Neurotransmitter Support</td>
</tr>
</tbody>
</table>
Factors for Cellular Hydration

Positive
- Water – hydration
- Cellular permeability
- Creatine
- Glutamine
- Glycine and alanine
- Carbohydrates
- Insulin sensitising nutrients
- Glycogen synthase enhancing aminos
- Insulin, GH

Negative
- Dehydration
- Lack of positive factors in adequate amounts
- Stress
- Inflammation
- Infection
- Oxidative Stress
A day’s example

• Add 1 tablespoon of ground linseeds to your breakfast shake
• Try meat and nuts for breakfast
• Take fenugreek ground with the linseeds in your morning shake
• Use cinnamon with all starchy carbohydrate based food
• Snack on almonds
• Keep to real proteins all the time outside of training, e.g. meat not shakes

• Complex Salads
• Grow above the ground vegetables
• Portion control
• Eat slowly, talk between each mouthful, put your fork down between each mouthful
• Add linseeds or psyllium husk to all shakes
• Use 10g glycine and glutamine in drinks 3 times each day
• Ensure adequate magnesium
• Relax in the evening whenever possible
## Hormonal Factors Affecting Protein Synthesis

<table>
<thead>
<tr>
<th>Over training</th>
<th>Decreases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testosterone</td>
<td>Increases</td>
</tr>
<tr>
<td>Growth Hormone</td>
<td>Increases</td>
</tr>
<tr>
<td>IGF1</td>
<td>Increases</td>
</tr>
<tr>
<td>Normal Thyroid Function</td>
<td>Increases</td>
</tr>
<tr>
<td>Excess Thyroid Function</td>
<td>Decreases</td>
</tr>
<tr>
<td>Cathecholamines (B-adrenic agonist)</td>
<td>Increases</td>
</tr>
<tr>
<td>Glucocorticoids</td>
<td>Decreases</td>
</tr>
</tbody>
</table>
Steroid Hormone Cascade

- Increase LH
- Increase Cholesterol
- DHEA
- Lower aromatase
- Lower SHBG
- Lower cortisol / stress
- Background hormones thyroid, catecholamines
- Systemic Factors

1. Cholesterol - LDL
   - Dihydroxycholesterol
     - Pregnenelone
       - Progesterone
         - Corticosterone
           - Aldosterone
         - 17-Hydroxyprogesterone
           - 11-Deoxycortisol
             - Cortisol
               - Cortisone
               - Androstenedione
                 - Testosterone
                   - Dihydrotestosterone
                   - Estrone (E1)
                     - Estrone Sulphate
                     - Estradiol (E2)
                       - Estradiol (E3)
                 - DHEA
                   - DHEA-Sulphate
                     - Estrone Sulphate

AROMATASE
Hormonal Response to Exercise

Moderate Intensity With Short Rest

- During exercise:
  - GH and cortisol increase
- Post exercise:
  - Cortisol decreases, T increases, and GH increases
- Adaptation = rise in T and GH and a reduction in C
- Heavier weights = T
- Shorter rest and higher lactate = GH & T
Extended High Intensity Exercise

- Without adequate recovery
- Raises cortisol levels
- Decreases GH
- Suppresses T level
- Depletes energy reserves
- Lower immune function
- Is not optimal for protein synthesis

- Subsequent sessions suffer in terms of performance
- No time to use nutritional protocols
- One long session gives less opportunity to boost hormones in a day
- 3 hour gap most benefit for recovery and sensible training day
- 6 hour gap optimal, e.g. train @ 8am – and 2pm
HOMA SCORE

The Homeostasis Model Assessment (HOMA) estimates steady state beta cell function (%B) and insulin sensitivity (%S), as percentages of a normal reference population. These measures correspond well, but are not necessarily equivalent, to non-steady state estimates of beta cell function and insulin sensitivity derived from stimulatory models such as the hyperinsulinaemic clamp, the hyperglycaemic clamp, the intravenous glucose tolerance test (acute insulin response, minimal model), and the oral glucose tolerance test (0-30 delta I/G).


- A waist circumference of < 100 cm excludes individuals of both sexes from being at risk of being insulin resistant. Waist circumference is a strong independent risk factor for insulin resistance and the most powerful regressor in our model. It replaces body mass index, waist:hip ratio, and other measures of total body fat as a predictor of insulin resistance and explains more than 50% of the variation in insulin sensitivity alone.

INSULIN

- Triggered by a rise in blood glucose
- Aminos promote insulin response
- Whey protein increases insulin
- Glutamine + leucine signals and increases insulin production
- The most anabolic hormone

- Stimulates SM uptake of aminos
- Stimulates cellular hydration
- Increases T production
- Lowers SHBG
- Works with LH to stimulate testicular T
- Aminos can stimulate independent of carbohydrates
INSULIN cont.

- The aging hormone
- Keep levels as low as possible outside of training recovery window
- Avoid all refined carbs outside of training window and special occasions
- Certain nutrients can assist with insulin function
- 80% of all health problems can be cured through insulin and adrenal management
Insulin Principles;

• Keep insulin as low as possible except post training
• Eat fat plus protein and fibre pre training
• Eat Carbs, plus protein post training
• Think about the insulin spike in relation to subsequent sessions
• Increase insulin sensitivity whenever and however you can
• Create fat burning machines who use carbohydrates as their nitric oxide
Balancing Insulin and Cortisol

[Glucose]

- Glycogen
- Insulin
- Poor performance
- FAT
- T, GH & IGF1

Time
Stuff that helps Excess Cortisol....

- **Glutamine**: Lowers cortisol levels

- **Phosphatidylserine**: 600mg shown to reduce cortisol levels when taken after exercise (Starks et al., 2008).

- **Vitamin C**: 1-1.5g shown to reduce cortisol levels when taken after endurance exercise (Bryer et al., 2006).

- **Antioxidants**: various antioxidants such as quercetin and polyphenols can help lower cortisol levels although the research is not that conclusive. They will certainly reduce the levels of free radicals and prevent the cell/tissue damage caused by physical stress.

- **Magnesium Orotate**: shown to reduce cortisol levels after physical training (Golf et al., 1998).

- **Adaptogens (e.g. Rhodiola Rosea)**: Helps the body to reach a homeostasis thereby reducing stress and fatigue (Olsson et al., 2008).

- **L-Lysine and L-Arginine**: There are several studies which support the use of these amino acids for normalizing the cortisol stress response in those with high trait anxiety (Smriga et al., 2007).

**Chili Out, Man!**
Don’t Forget

• Low cortisol is as bad as chronically high cortisol levels
  – (-ve feedback, switches off inflammation)
• Lower cortisol levels increase fatigue, particularly in the morning and afternoon
• Cortisol imbalances may result in evening wakefulness
• The right protocol needs to be in place to exert the right effect
Anytime you get a chance.....

- INCREASE INSULIN SENSITIVITY;
- 14 day very low carbohydrate, fat adaptation phase
- Adapt as necessary to accommodate training load
- Injury – or period of time which is non-recreational is perfect for resetting insulin
The more insulin sensitive you are the more you carbs you can use for recovery;

- **LIFESTYLE**
  - Lower body fat, this will increase insulin sensitivity
  - Sleep 8-10 hours and nap in the afternoons for 30 mins whenever possible. Take magnesium and a ZMA formula before each sleep.
  - Take time to distress, avoid dietary stressors; excess caffeine, excess sugar, allergens, anti-nutrients
  - Try to practice meditation, stretching or yoga to assist mental relaxation
  - Get regular de-stressing habits into your week, massage, massage, and more massage, oh and film
Skinny Insulin guys and fat Insulin guys

- A high abdominal skinfold (above 15mm) or waist skinfold (above 10mm) MAY indicate an imbalance in insulin and cortisol production at the time of fat storage. A high subscapular skinfold (above 15mm) suggests a genetic intolerance to starchy carbohydrate foods
- Fat thin skinny bitches
- A high fat % above 15% will indicate some need for insulin management
- Some experts maintain up to 80% of all disease is insulin and adrenal imbalance driven
INSULIN MANAGEMENT NUTRIENTS

BLOOD GLUCOSE BALANCE
- Mg, biotin

GLUCOSE TOLERANCE FACTOR
- Zn, Cr, B3

CELL MEMBRANE
- OMEGA 3
- Krill Oil
- CLA

INSULIN MIMICKERS
- ALA
- Vanadium
- Bitter melon
- Gynmena

RECEPTOR SITE
- Fenugreek
- Linseeds

- The best ones;
- Fish oils
- Alpha lipoic acid
- Carbohydrate management
- High strength multi
- ZMA
- Specific blood glucose balancing blend;
- Endurabolics (metagenics)
- Glucose optimizer (Jarrow)
- Glycemic Factors (Biochem)
Insulin-Supplementation

• SUPPLEMENTATION
• Regularly consume; a multi vitamin, fish oils, krill oil, antioxidants (switch types) ZMA
• Herbs; gymnema sylvestre, fenugreek, grape seed extract
• Minerals; chromium, niacin, zinc, magnesium – go for blood glucose formula
• Aminos; carnitine 2g t.i.d, glycine 5-15g b.i.d, glutamine, 5-15g b.i.d, taurine 2g t.i.d
• Alpha lipioc acid after each meal
Human Growth Hormone

• Secreted by pituitary

• Stimulate bone growth

• Stimulates amino acid uptake

• Protein synthesis

• Muscle glucose uptake

• Improves immune cell function and capacity

• Increased fat burning

• It’s release is blunted through high body fat and high fat meals

• Excess stress and lack of sleep
Growth Hormone’s Effects

Diagram showing the effects of Growth Hormone on Fat and Liver.

Graph showing Human Growth Hormone levels as related to aging.
GH and EXERCISE

• The more adverse the conditions the higher the GH release
• Acute bouts of resistance training
• High intensity
• Anaerobic bouts
• Balance between oxygen demand and availability

• Low carbs increases GH
• Sprint trained athletes better response than endurance based
• Lactate, serum Ph, ATP depletion, low glucose, oxygen deficit
• GH potentiates other anabolic hormones
• Accelerates acid excretion
GH & Exercise

- Increases with
  - Maximal rowing
  - 30 sec sprints
  - Serum GH response greatest when period of exercise had more rest between them

- Decreases with;
  - Repeated 10 min rowing each hour
  - Short recovery between sessions decreases GH production, lowers T production and increases C production
A clear need for natural enhancement in our teams........

Fig. 1 Decline in daily production of growth hormone with age.
Natural GH Interventions

• May have a greater effect in athletes over 25 years
• Do not down regulate natural GH production
• Increasing GH, IGF1, insulin production and sensitivity results in powerful synergistic effect on body composition;
• Arginine, ornithine, ALA, cr, and zn.
• These plus glutamine, GABA, lysine, glycine, tyrosine and taurine increase IGF1 even further!
Factors which can increase GH

- Lactate
- Low blood glucose
- Small muscle group workouts
- Certain aminos;
  - Arginine
  - Ornithidine
- OKG
- Glutamine
- GABA, lysine, glycine, tyrosine, taurine
- High GH decreases cortisol
- High GH inhibits myostatin expression
- Increased muscle blood flow
- Increased insulin sensitivity
Some Studies on Aminos & GH

- **Amino Acids Study Results**
  - Intravenous Ornithine Produces a five-fold increase in serum growth hormone in humans
  - Ornithine Increased serum growth hormone in bodybuilders, up to four times the baseline level
  - Arginine 250 mg/kg/day of oral arginine aspartate given to five healthy subjects for seven days caused a 60% rise in GH during slow wave sleep compared to the control period. Arginine and Ornithine In a double-blind study, adult males participating in a 5-week progressive strength-training program who consumed 2 grams of L-arginine and 1 gram of L-ornithine experienced significantly higher total strength and lean body mass scores and excreted less urinary hydroxyproline than placebo-treated subjects.
  - Ornithine Alpha-ketoglutarate (OKG) Significantly increased IGF-1 and growth hormone levels in trauma patients. In healthy subject, OKG increased tissue levels of growth-hormone-releasing glutamine.
  - Arginine and lysine 1200 milligrams of arginine pyroglutamate combined with L-lysine hydrochloride significantly elevated biologically active growth hormone from two to eight times the baseline value in 15 healthy male subjects aged 15 to 20 years old.
  - Arginine and lysine 1,500 mg arginine and 1,500 mg lysine increased GH in young men only during resting conditions. Glycine In 19 normal, non-obese subjects, 6.75 grams of glycine increased growth hormone levels up to 300 to 400 percent that of baseline.
  - Glycine and L-arginine Increased the subjects mean resistance to fatigue up to 28% over the controls during acute exhaustive high-intensity anaerobic isokinetic exercise and produced an overall gain in total muscle work of 10.5% more than controls.
Muira Puama – Dopa Bean aka Broad Beans!

Fig. 2  Effect of L-dopa administration on plasma GH concentrations in normal subjects.
Simple GH Protocol

- ZMA
- 5HTP
- Arginine Pyroglutamate
- Nitric Oxide
- Tyrosine
- ARGININE
- OKG
- GLUTAMINE
- Secretagogues
- L-dopa
ZMA

- Competitive NCAA Football players

- ZMA nightly for 8 weeks

- 30% increase in total and free T

- Strength increased by 11.6% over 4.6% in placebo group
TESTOSTERONE/OESTROGEN RATIO

• T will enhance strength, increase muscle protein synthesis, size and athletic performance

• Ways to increase this naturally will obviously be of a competitive advantage to the athlete

• Ways to prevent levels dropping below normal during periods of over-reaching will also be of benefit

• Excess stress lowers T

• Shorter duration high intensity sessions of no longer than 60 minutes appear to be best

• Strong exercise such as weights and sprinting appears to help best
Testosterone cont.....

- Testosterone anti catabolic effect is in part dependent on its ability to block cortisols catabolic effect. As such all protocols aimed at lower cortisol should positively effects testosterone effects in the body. Stress also has a negative effect on testosterone production through it’s cortisol raising effects.

- Testosterone also has an independent action in protein synthesis so anabolic nutritional support around T boosting protocols is essential.

BASICS
- Eating too much sugar and creating too much insulin chronically will lower T levels. Dehydration will lower T levels.

ANTI STRESS
- Make sure sources of excessive stress are kept to a minimum and where they do occur adequate recuperative strategies are in place to compensate. Follow cortisol / adrenal protocols if stress is an issue.
DI-Estrogen & T DIET

• INCREASE; zinc rich foods, pumpkin seeds, Oysters, ginger root, lamb chops, split peas, brazil nuts, soy lecithin, black pepper, paprika, mustard, chilli powder, thyme, cinnamon, sardines, almonds, walnuts, rye, oats, tuna, anchovies, and haddock

• FIBER RICH FOODS; linseeds, whole oats, fibrous vegetables, fiber supplements apple fibre, psyllium husk

• DETOXIFICATION SUPPORTING FOODS; see list in detox guide, all crucerifous vegetables, broccoli, cauliflower, brussels sprouts, kale, cabbage,

• OTHER BENEFICIAL FOODS
  • Curcumin (turmeric) and other spices
  • B complex foods and supplements
  • Vitamin C foods and supplements
  • All flavanoids particularly citrus and grape; fresh juice with a whole lemon, a big slice of ginger and a kiwi fruit
  • Green tea; drink 5 cups a day, consider green tea extract supplement
  • Mixed E rich foods; increase organic raw nuts and seeds, 1 handful of nuts per day suggested
Ways to Free testosterone

• Blocking T – DHT
• Lowering SHBG
• Lowering aromatase
• Raising LH
• Raising cholesterol
• Lowering estrogen
• Increasing receptor site sensitivity
Sixty-six patients have been treated with Panax Ginseng C.A. Meyer extract, of whom 30 oligoastenospermic sine causa (group A), 16 oligoastenospermic with idiopathic varicocele (group B). Twenty age-matched volunteers were used as controls (group C). Use of Panax Ginseng extract showed an increase in spermatozoa number/ml and progressive oscillating motility, an increase in plasma total and free testosterone, DHT, FSH and LH levels, but a decrease in mean PRL. It is suggested that ginsenosides may have an effect at different levels of the hypothalamus-pituitary-testis axis.

**Key words:** Ginseng - Fertility, male.
Ways to Lower it....

• Alcohol
• Low protein intake
• Excess aromatase
• Stress
• Drugs
• Deficiencies
• Poor digestion
• Dehydration
SHBG

- Regular Meals!!!
- Chronically High insulin raises SHBG
- GH
- Avena Satvia 1.5g per day
- Utica Dioca aka Stinging Nettles
- Muira Puama
Avena Satvia

• Under-eating is related to higher SHBG concentrations.
• Over-training is related too.
• Over-eating, conversely, lowers SHBG.
• Insulin (acute) is inversely related to SHBG levels.
• Particular supplements appear to reduce SHBG binding.
Chronic Inflammation

All natural elements involved in moderating the inflammatory response

• Ginger
• Rosemary
• Turmeric
• Boswellia

• Eat an anti-inflammatory diet; this is close to the Mediterranean diet
• Take anti-inflammatory herbs (rosemary, oregano etc), spices (all) and supplements such as fish oil and krill oil

• See injury pack information for more ideas
Spice up your life

OTHER BENEFICIAL FOODS

• Low fat sources of dairy, probiotic enriched foods – watch for sugar content
• Bitter gourd
• Cinnamon
• Curcumin (turmeric) and other spices
• Mineral rich foods and supplements; magnesium, zinc, chromium
• All flavanoids particularly citrus and grape; fresh juice with a whole lemon, a big slice of ginger and a kiwi fruit
• Green tea; drink 5 cups a day, consider green tea extract supplement
• Mixed E rich foods; increase organic raw nuts and seeds, 1 handful of nuts per day suggested
Stuff that may work.....

- ALC
- B5
- Panax ginseng
- Rhodiola Rosea
- SUMA
- Avena Sativa
- Cordyceps
- Tribulus

- MACA
- Catuba
- Ashwaganda
- Deer Antler
- Green Tea
- Zinc
- Magnesium
- Arginine
SLEEP

- Do you have trouble falling asleep?
- Do you find it difficult to wake up?
- Do you sleep less the 8-9 hours?
- Do you wake once or more?
- Do you sleep in a room with light or noise?

Answer the following questions yes if it applies to you more than once each week.

If you answered yes to 2 or more of these questions you need to look at working on your sleeping patterns.

www.sportsnutritionvlog.com
SLEEP

- Do you wake up feeling tired?
- Do you wake up with an alarm?
- Do you go to bed later than 11pm?
- Do you get up earlier than 6am?
- Do you use medication to get to sleep?

- If you answered yes to 2 or more of these questions you need to look at working on your sleeping patterns.
## Circadian Rhythm

<table>
<thead>
<tr>
<th>Trytophan Foods;</th>
<th>Cottage cheese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build serotonin;</td>
<td>Emental cheese</td>
</tr>
<tr>
<td>Tranquilizing neurotransmitter;</td>
<td>Turkey</td>
</tr>
<tr>
<td>Induces sleep,</td>
<td>Banana</td>
</tr>
<tr>
<td>Stops carb cravings</td>
<td>Salmon</td>
</tr>
<tr>
<td>Helps depression</td>
<td>Duck, pheasant</td>
</tr>
</tbody>
</table>
Circadian Rhythm

- Tyrosine pathway;
- Catecholamines;
  - Adrenaline
  - Noradrenaline
  - L-Dopa
- Alertness,
- Anti fatigue,
- Mood enhancer
- Appetite suppressant

- Meat
- Nuts
- Eggs
- Red Vegetables
- Chocolate (70%)
- Avocado
- Dairy
SLEEP PROTOCOL

- ZMA
- GH releasers
- 5HTP
- Tryptophan
- Magnesium –
- Epsom salt baths
- Herbs; valerian
- St John’s Wort

- Waking cycles
- Within 1 hour = sugar
- Within 3 hours = liver
- E.g. 12-3am
- From 3am- 5am
  normally stress related, can be caused through
  low cortisol
- Licorice tea before bed
BRAIN HEALTH

- Neurotransmitter deficiency
- Amino acid therapy
- Brain regeneration programme ACL, Co Q 10 & ALA –
- Aging brain
- Restores function and reduces brain damage and brain disease symptoms
Periodization of Supplements

SUPPLEMENTATION

• Regularly consume; a multi vitamin, fish oils, antioxidants (switch types) ZMA

• Cycle testosterone supporting herbal formulas, change these each 2 weeks (ideal) or month

• Compounds such as DIM and Indole 3 carbinol will assist these detoxification pathways and may have a direct estrogen moderating effect. These occur in high amounts in cruciferous vegetables; watercress is the best of these

• Calcium D glucarate, Calcium D-glucarate is a botanical extract found in grapefruit, apples, oranges, broccoli and Brussels sprouts. Scientists are discovering that it appears to protect against cancer and other diseases via a different mechanism than antioxidants such as vitamin C, carotenoids, and folic acid. These vitamin antioxidants work by neutralizing toxic free radical damage in the body and detoxifying excess estrogen
Conclusion
Get Basics Right First.....

- EXERCISE AND PROTEIN CONSUMPTION
- Eat less refined carbs and drink less alcohol, drink more water
- Take time to de-stress and do activities which help you to accomplish this
- Devote time to proper sleep, catch up with small naps if you can
- Train with weights and eat a lot of protein at regular intervals

*Once you are doing all this you are ready for the next level*