

Based on Cleveland HeartLab's experience in testing extreme and professional athletes and given the relative youth of these individuals we find that risk or laboratory abnormalities are generally:

- muscle breakdown and hydration status leading to altered renal health
- oxidation/inflammation leading to potential decreased arterial health
- lipid abnormalities leading to altered cholesterol metabolism and long-term cardiovascular risk

Importantly each of the markers outlined below is modifiable through modulation of nutrition status, training and hydration. Therefore, use of this testing offers the potential to optimize near-term and long-term health, addressing the fact that extreme athletes and rigorous conditioning do not have an extended lifespan compared to the average person.

Each of Cleveland HeartLab's markers has been scientifically validated and demonstrated to be clinically useful and modifiable.

Hypothesis: To enhance renal and arterial health increasing Omega-3 levels in athletes will increase their performance and decrease adverse metabolic effects of extreme conditioning

Implementation: Intake of Zack-Snacks will increase Omega-3 levels and prevent the rise in markers of oxidation and inflammation associated with the activities of professional athletes

Plan:

- Professional football players will have baseline testing prior to initiation of training camp.
- One half of the teams will start consuming 4 cookies daily for a total of 6 weeks
- Repeat testing will be conducted at 2, 4 and 6 week intervals

Biomarkers to be measured:

- Omega 3/6 fatty acid levels
- F2-isoprostane – marker of general oxidation
- Albumin/Creatinine Ratio – marker of endothelial dysfunction
- ADMA – marker of nitric oxide bioavailability for vascular relaxation
- Ox-LDL – marker of lipid oxidation and metabolic syndrome risk
- Cystatin C and SDMA – measures of renal function independent of serum creatinine
- hsCRP – measure of systemic inflammation
- MPO and Lp-PLA2 – measures of vascular inflammation

Expected outcome:

The consumption of Zack-Snacks will lead to an increase in Omega-3 fatty acid levels. This increase will lead to a decrease in system oxidation and inflammation; and the downstream consequences including metabolic and inflammatory markers of renal and vascular stress.