

Pilot Studies and Company Overview





The Internal Fitness™ Company

We are a human performance company that uses gut microbiome testing data and a registered dietitian to personalize nutrition and lifestyle recommendations.

**Ixcela's technology is based
on 60+ years of research.**

Ixcela is based on 60+ years of research



Boston University
School of Medicine



Massachusetts
Institute of
Technology

Erika Angle, Ph.D.

CEO, Co-founder, Founder Science from Scientists

- BS, MIT (2004); PhD, BU School of Medicine (2012)
- Boston Chamber of Commerce Pinnacle award
- Boston Business Journal 40 Under 40 award
- Boston Chamber of Commerce Ten Outstanding Young Leaders award
- Boston University Young Alumni Award



Massachusetts
Institute of
Technology



U.S. Department
of Veterans Affairs

Wayne Matson, Ph.D. (MIT)

Sr. Scientist, Co-founder, Founder ESA, Inc.

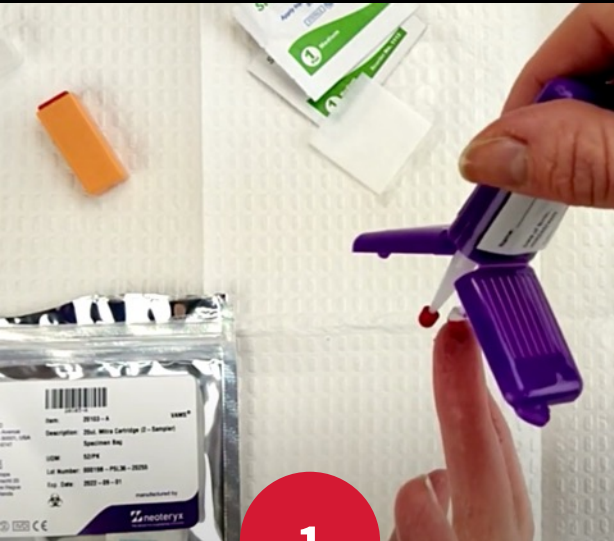
- Inventor of CoulArray™ technology
- Father of metabolomics
- 130 patents; author ~100+ research papers
- In cooperation with CDC, developed globally used lead test for children
- Harvard, UCLA, NASA, and dozens of other research institutions



MASSACHUSETTS
GENERAL HOSPITAL

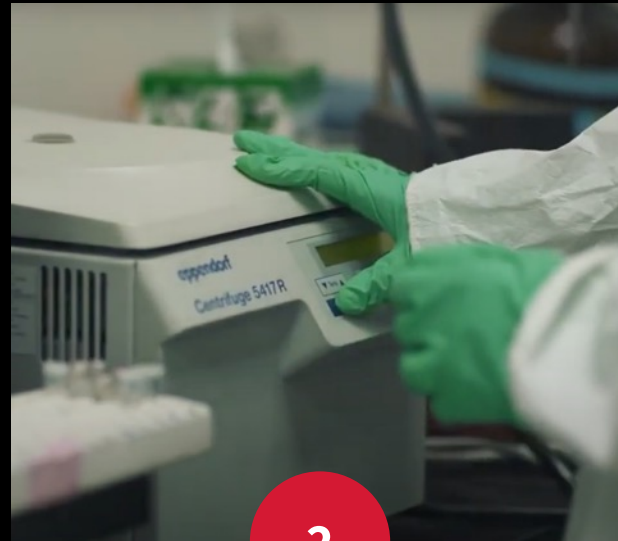


How do Ixcela programs work?



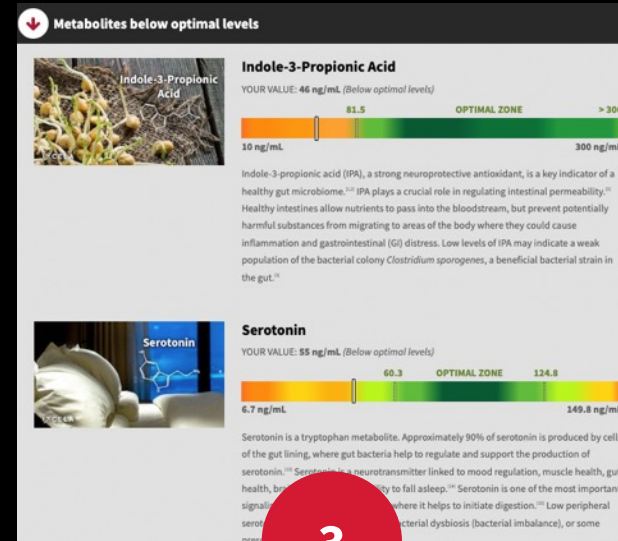
1

- Collect pinprick sample at home
- Send to us using prepaid FedEx envelope



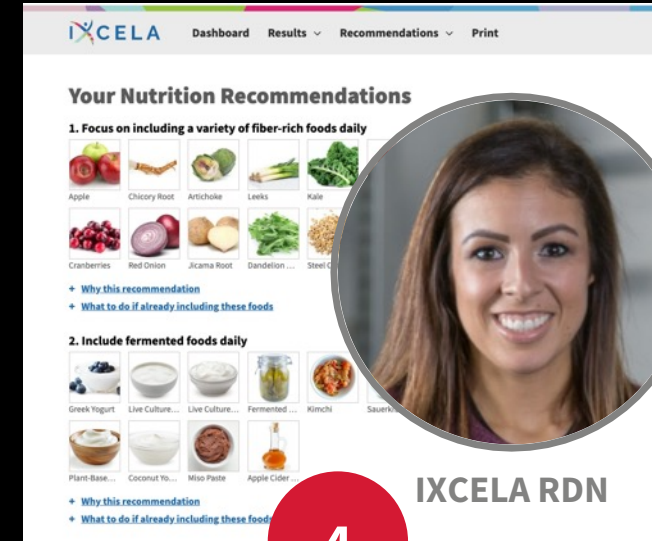
2

- Ixcela scientists analyze your blood sample to get metabolite data
- Results post in about 10 days



3

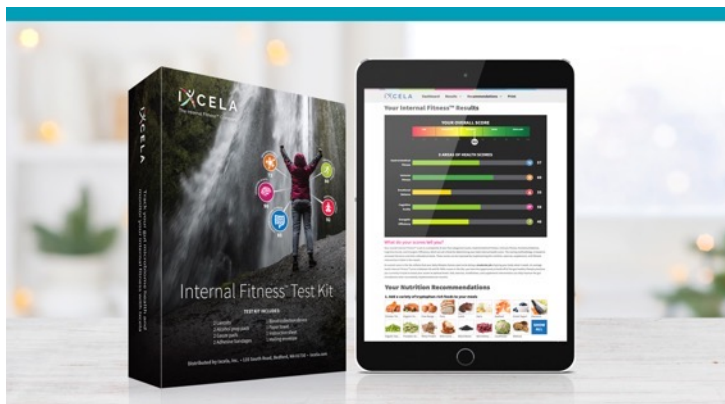
- Metabolites below or above optimal levels trigger personalized nutrition, supplement, and lifestyle recommendations



4

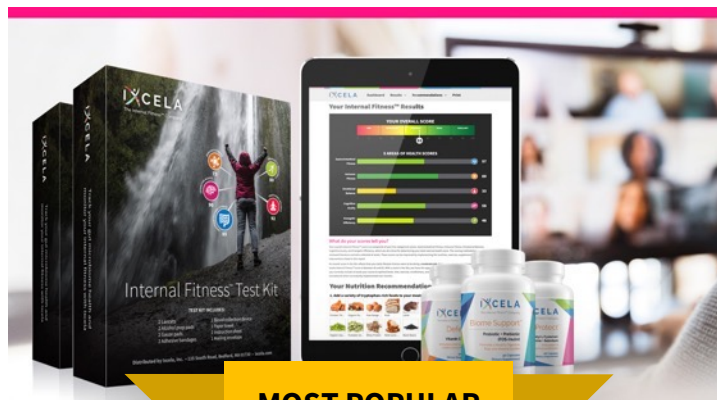
- Ixcela performance registered dietitian meets virtually with you to explain results and prioritize recommendations based on your goals and willingness to change
- Implement your unique action plan on your own or choose to continue working with our dietitian for 90-days

Ixcela Program Options



Kickstart Assessment Program

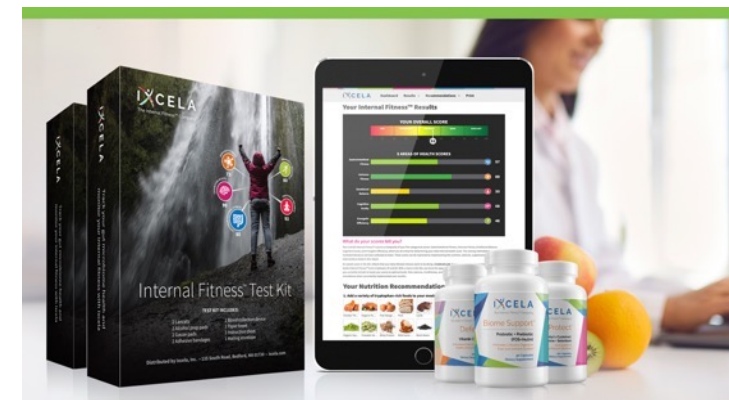
- 1 Ixcela test kit
- 1 private virtual session with an Ixcela RDN
- 1 prioritized action plan based on your results, goals, and willingness to change (DIY Plan)



MOST POPULAR

Complete Package Program

- 2 Ixcela test kits
- **3 private virtual sessions** with an Ixcela RDN
- 2 prioritized action plans based on your results, goals, and willingness to change
- Weekly accountability check-ins through messaging with an Ixcela RDN
- 90-day supply of Ixcela supplements recommended in your first report
- 90-day access to the Ixcela recipe, mindfulness, and exercise libraries

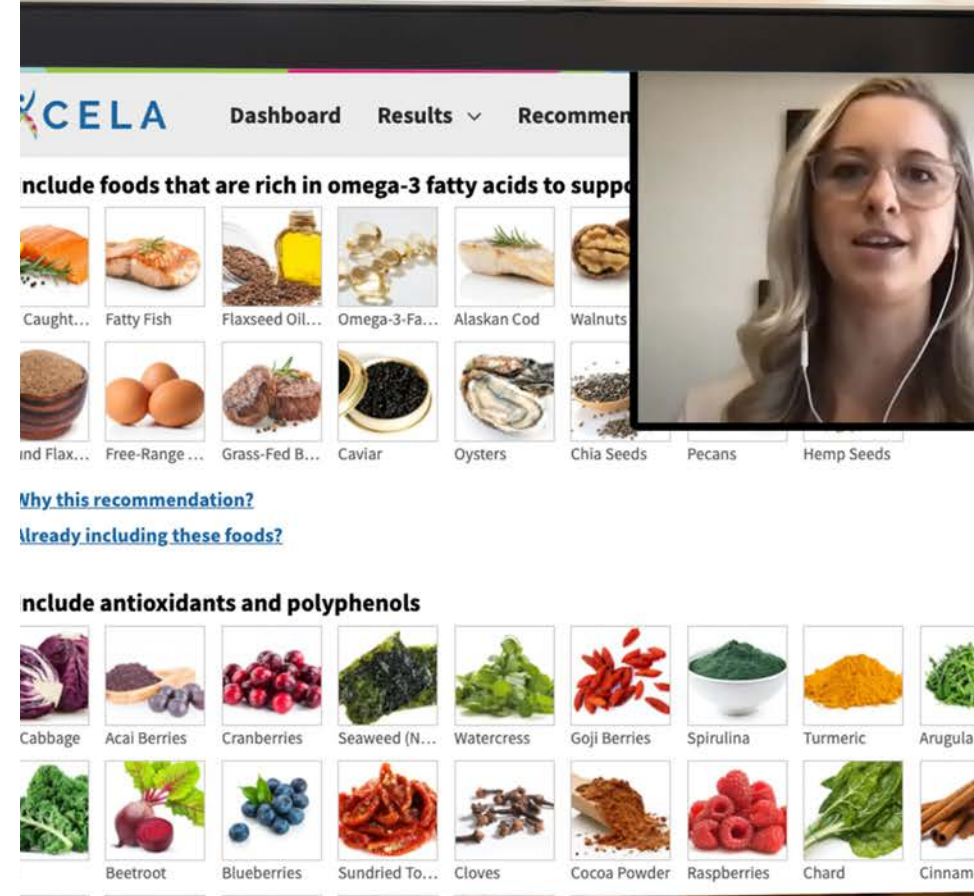


Personalized Accountability Program

- 2 Ixcela test kits
- **9 private virtual sessions** with an Ixcela RDN
- 2 prioritized action plans based on your results, goals, and willingness to change
- Weekly accountability check-ins through messaging with an Ixcela RDN
- 90-day supply of Ixcela supplements recommended in your first report
- 90-day access to the Ixcela recipe, mindfulness, and exercise libraries
- **Basically, RDN on-call**

Here's how we did our pilots:

- Before and after Ixcela testing
- Weekly communication from a registered dietitian to provide guidance and accountability
- Baseline data includes Ixcela testing data and self-reported data from client interview and/or the first two weeks of daily logs
- Exit data includes Ixcela testing data and self-reported data from client interview and/or the last two weeks of daily logs
- Duration of the pilots: 90 days unless noted (Ex: Oracle Team USA was a 9-month study)



The screenshot displays the Ixcela website interface. At the top, there is a navigation bar with the Ixcela logo and menu items: Dashboard, Results, and Recommendations. Below the navigation bar, a section titled "include foods that are rich in omega-3 fatty acids to support" is visible. This section features a grid of food items, each with a small image and a label: Caught..., Fatty Fish, Flaxseed Oil..., Omega-3-Fa..., Alaskan Cod, Walnuts, and Hemp Seeds. Below this grid, there are two blue links: "Why this recommendation?" and "Already including these foods?". Another section titled "include antioxidants and polyphenols" is also visible, featuring a grid of food items with labels: Cabbage, Acai Berries, Cranberries, Seaweed (N...), Watercress, Goji Berries, Spirulina, Turmeric, Arugula, Beetroot, Blueberries, Sundried To..., Cloves, Cocoa Powder, Raspberries, Chard, and Cinnamon. In the top right corner of the screenshot, there is a video call window showing a woman with blonde hair and glasses, wearing a headset, who appears to be a dietitian providing guidance.



90-DAY PILOT STUDIES

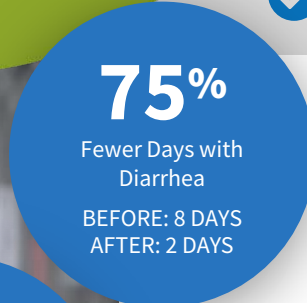
Runners and Triathletes

Testing + Weekly Dietitian Guidance



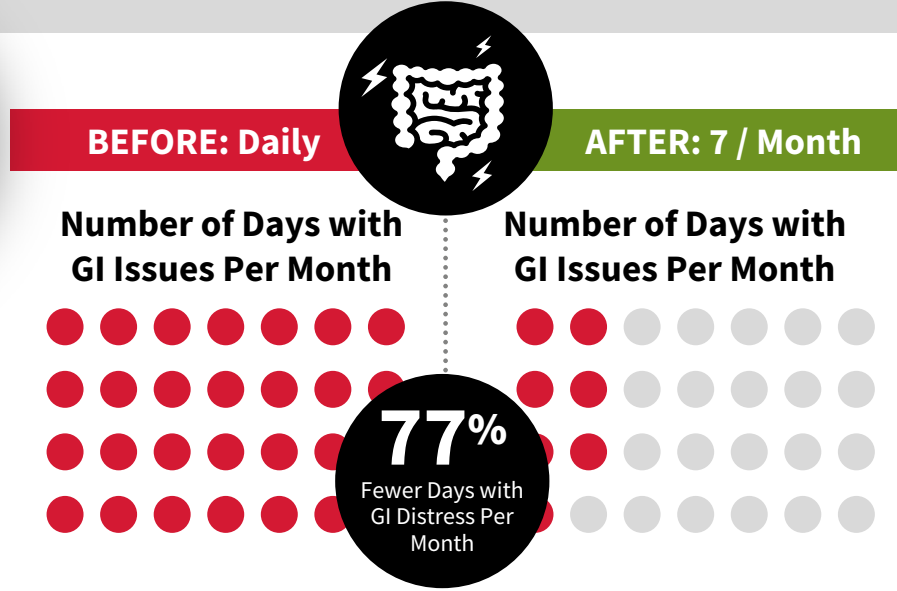
Ironman Triathlete Hayden

- Pediatric medical resident in his 30s who enjoyed racing
- Came to Ixcela with daily stomach issues and would have severe GI discomfort for days after intense training and racing.
- Struggled with these gut symptoms for years. Although he had seen doctors about his symptoms, he hadn't gotten the answers he needed so he could start to feel better and train without discomfort.



Ixcela testing revealed primary actions needed were:

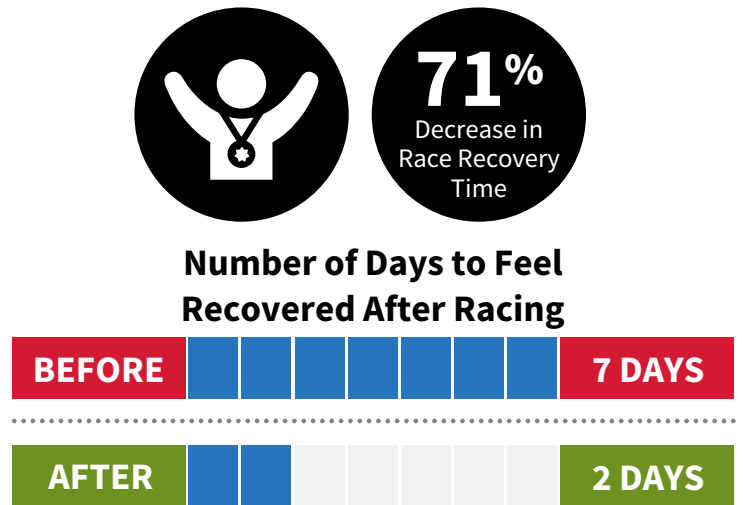
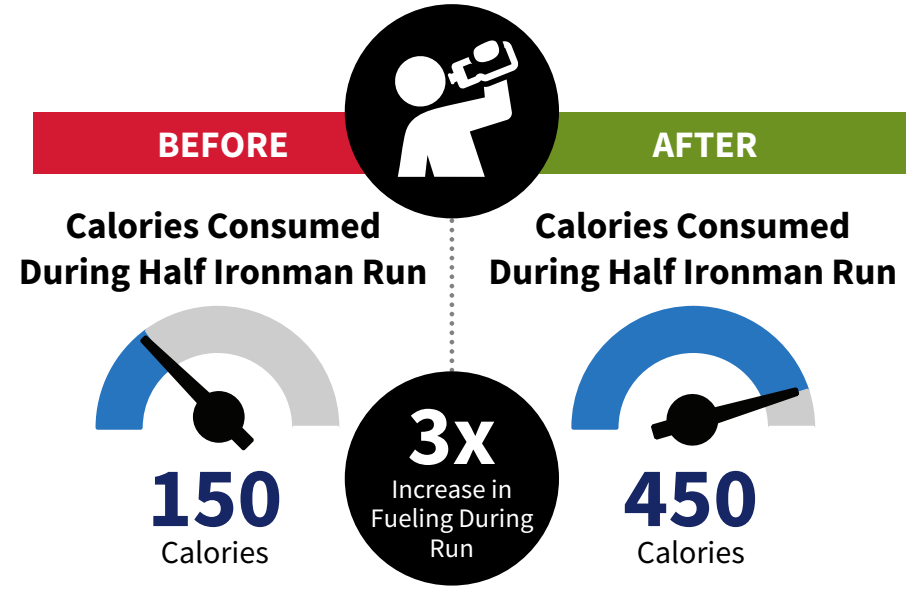
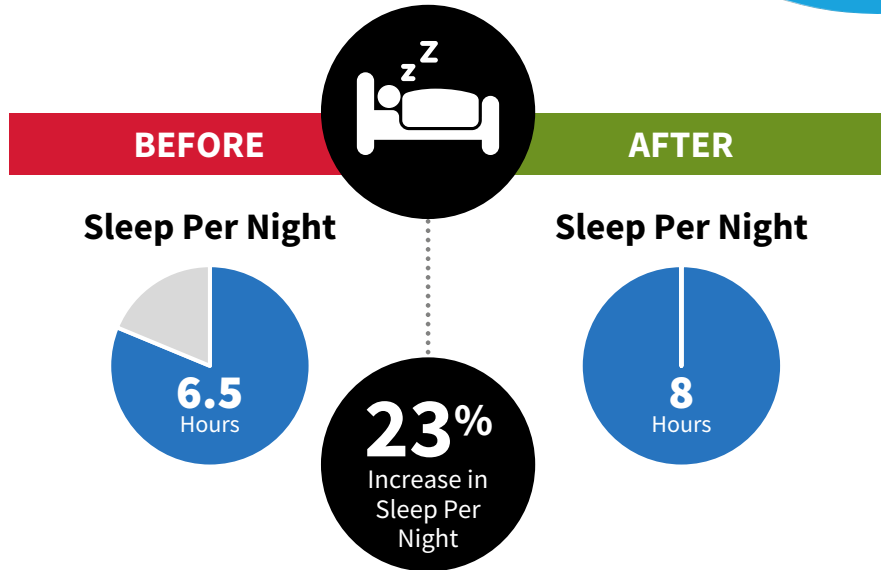
- ✓ Nutrition swaps
- ✓ Sleep hygiene
- ✓ Rest days





~10 MIN
FASTER
IRONMAN 70.3
FINISH TIME

BEFORE: 5 hrs, 31 min, 54 sec
AFTER: 5 hrs, 21 min, 57 sec



4x Ironman Champion Sarah

- Professional triathlete Sarah Piampiano suffered from IBS symptoms, constipation, night sweats, disrupted sleep, and general fatigue. Due to Hashimoto's disease, she had been taking a thyroid replacement since childhood. A variety of dietary changes had not provided relief.
- Sarah came to Ixcela to find ways to reduce inflammation and improve recovery.

Ixcela testing revealed primary actions needed were:

✓ Nutrition swaps

✓ Supplement swaps

75%
**REDUCTION IN
FLUID RETENTION**
(AFTER IRONMAN RACING)

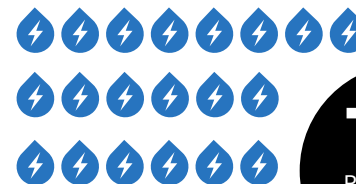
BEFORE: 20 lbs

AFTER: 5 lbs

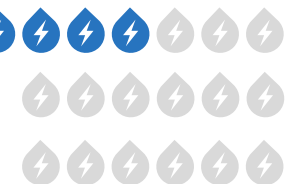
BEFORE: 20 lbs.

AFTER: 5 lbs.

Pounds of fluid
retained after racing



Pounds of fluid
retained after racing



75%

Reduction in
Fluid Retention
After Racing



50%
**DECREASE IN RACE
RECOVERY TIME**

BEFORE: 3-4 WEEKS
AFTER: 1-3 WEEKS

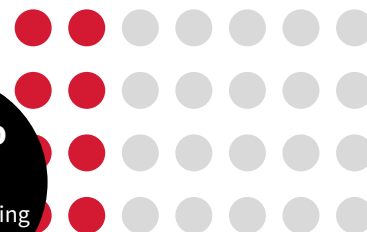
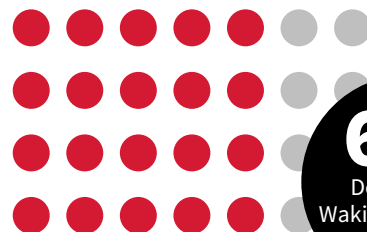


BEFORE: 5-6 Nights

AFTER: 1-2 Nights

**Number of Nights Waking
Up During the Night**

**Number of Nights Waking
Up During the Night**



60%
Decrease In
Waking Up During
the Night

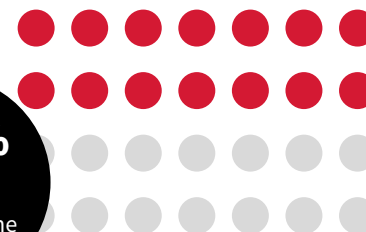
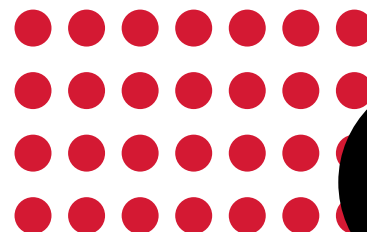


BEFORE: 3-4 Weeks

AFTER: 1-3 Weeks

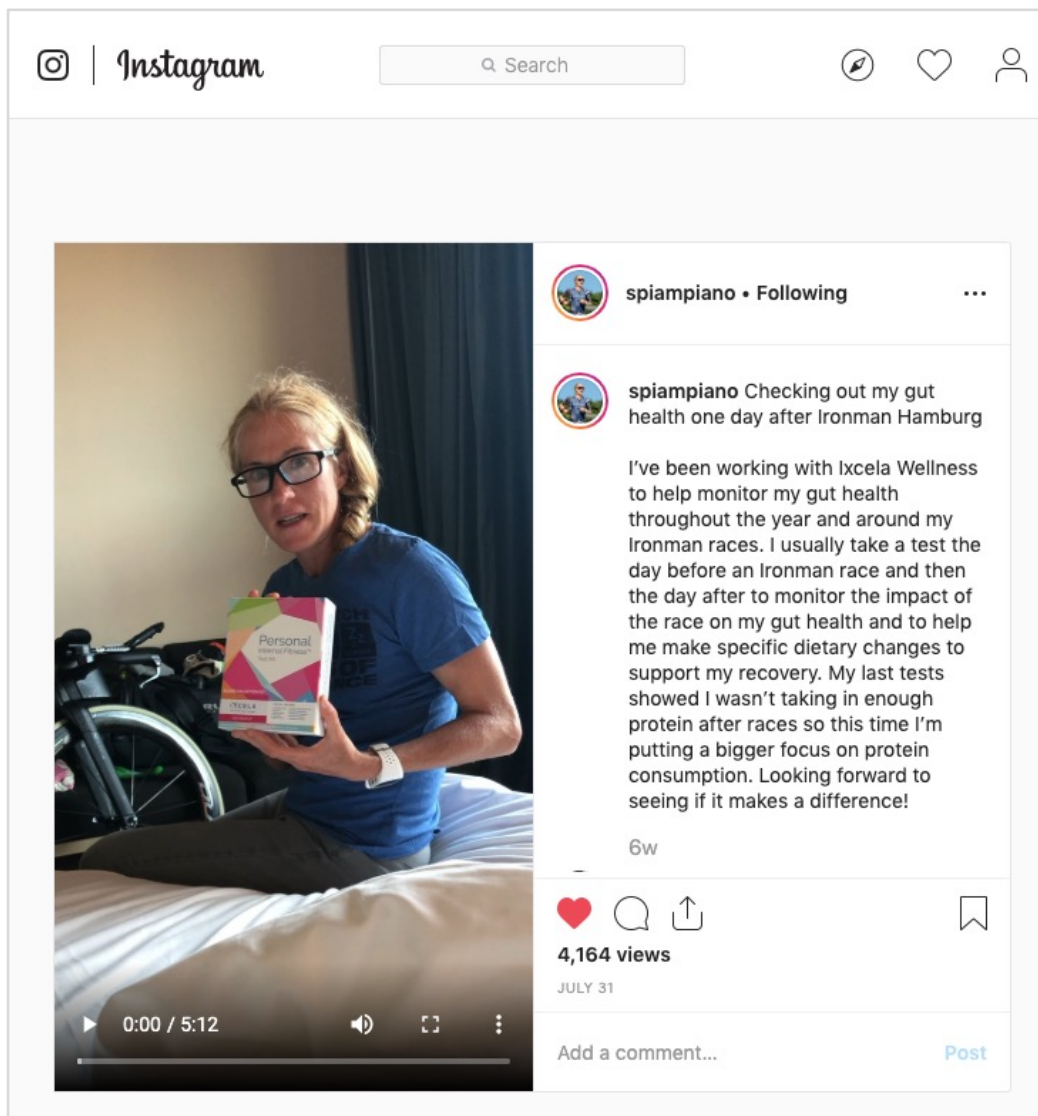
**Number of Weeks Needed
for Recovery After Racing**

**Number of Weeks Needed
for Recovery After Racing**



50%
Decrease In
Recovery Time

Sarah's consistent podium finishes



DATE	RACE	PLACE
28 July 2019	Ironman Hamburg (Germany)	2 nd Overall Female
14 July 2019	Ironman 70.3 Astana (Kazakhstan)	3 rd Overall Female
7 July 2019	Ironman 70.3 Manta (Ecuador)	1 st Overall Female
26 May 2019	Ironman Brazil	1 st Overall Female
4 May 2019	Ironman 70.3 St George (US Pro Championships)	6 th Overall Female
18 Dec 2018	Ironman South American Championship	4 th Overall Female
18 Nov 2018	Ironman 70.3 Xiamen	3 rd Overall Female
14 Oct 2018	Ironman World Championships - Kailua-Kona, HI	11 th Overall Female
22 July 2018	Ironman Lake Placid - Lake Placid, NY	3 rd Overall Female
24 Jun 2018	Ironman 70.3 Coeur d'Alene - Coeur D'Alene, ID	2 nd Overall Female
27 May 2018	Ironman Brazil - Florianopolis, BR	2 nd Overall Female
22 Apr 2018	Ironman 70.3 Lima - Lima, PE	1 st Overall Female
14 Apr 2018	Ironman 70.3 Liuzhou - Liuzhou, CHN	3 rd Overall Female



Marathoner Mom Rachel

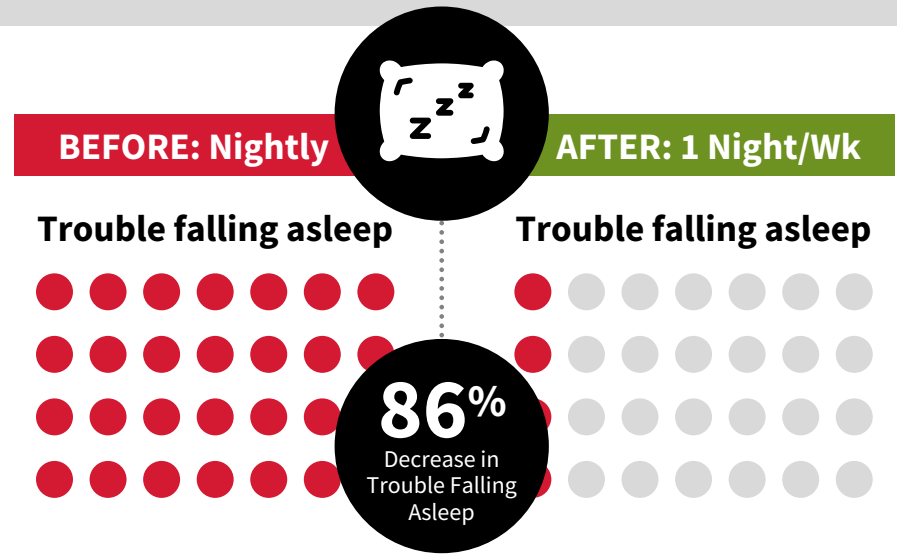
- Career professional and mom. In celebration of her 30th birthday, she wanted to run 30 miles.
- Came to Ixcela with nightly sleep issues due to being a new mom.
- She also wanted to find out if she should focus on reducing the amount of stress on her body in order to avoid injuries such as shin splints and plantar fasciitis, which she had suffered through during marathon training.

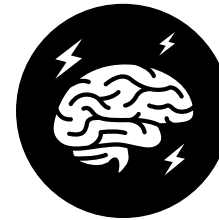
Ixcela testing revealed primary actions needed were:

- ✓ Supplements
- ✓ Sleep hygiene
- ✓ Drink swaps

86%
**DECREASE IN
TROUBLE FALLING
ASLEEP**

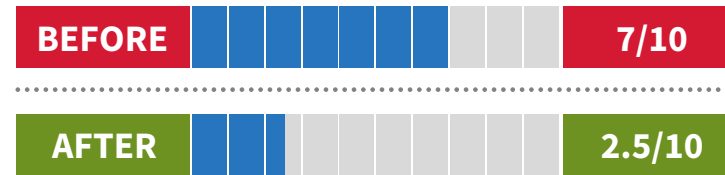
BEFORE: NIGHTLY
AFTER: 1 NIGHT/WEEK





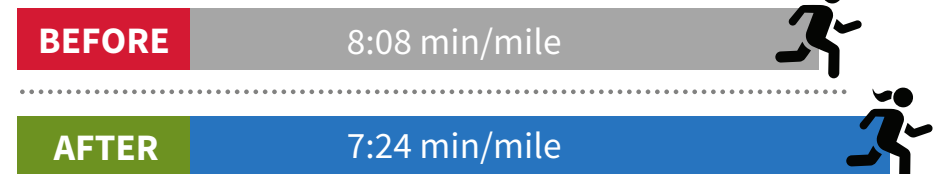
64%
Decrease in
Feelings of
Stress

Average Stress Level



9%
Increase in
5K Run Pace

Improvement in 5K Run Pace





Low Energy Case Study

- Jon, a retired Navy SEAL commander, meditation teacher, and speaker, was experiencing low energy, poor sleep, and a lack of mental clarity.
- Although balanced nutrition was important to him, he found himself skipping meals, overconsuming caffeine, and resorting to fast food, which triggered irregular digestion and heartburn.
- He came to Ixcela looking for support to improve his energy, lose weight, and reduce his stomach issues.

60%
DECREASE IN MENTAL STRESS

BEFORE: Rated 4 out of 10
AFTER: Rated 1.6 out of 10

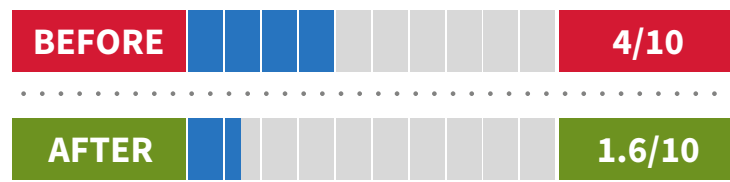
Ixcela testing revealed primary actions needed were:

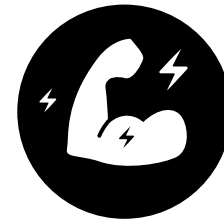
- ✓ More protein
- ✓ Sleep hygiene
- ✓ Drink swaps



60%
Decrease in Feelings of Stress

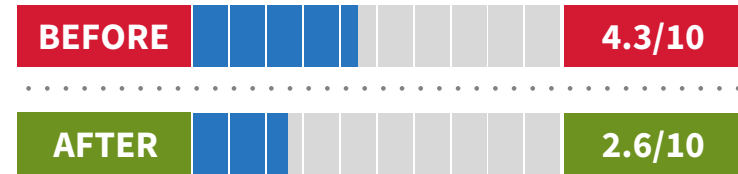
Average Mental and Emotional Stress





43%
Decrease in
Fatigue

Average Level of Physical Fatigue



Sleep Per Night



42%
Increase in
Sleep Per
Night

Sleep Per Night

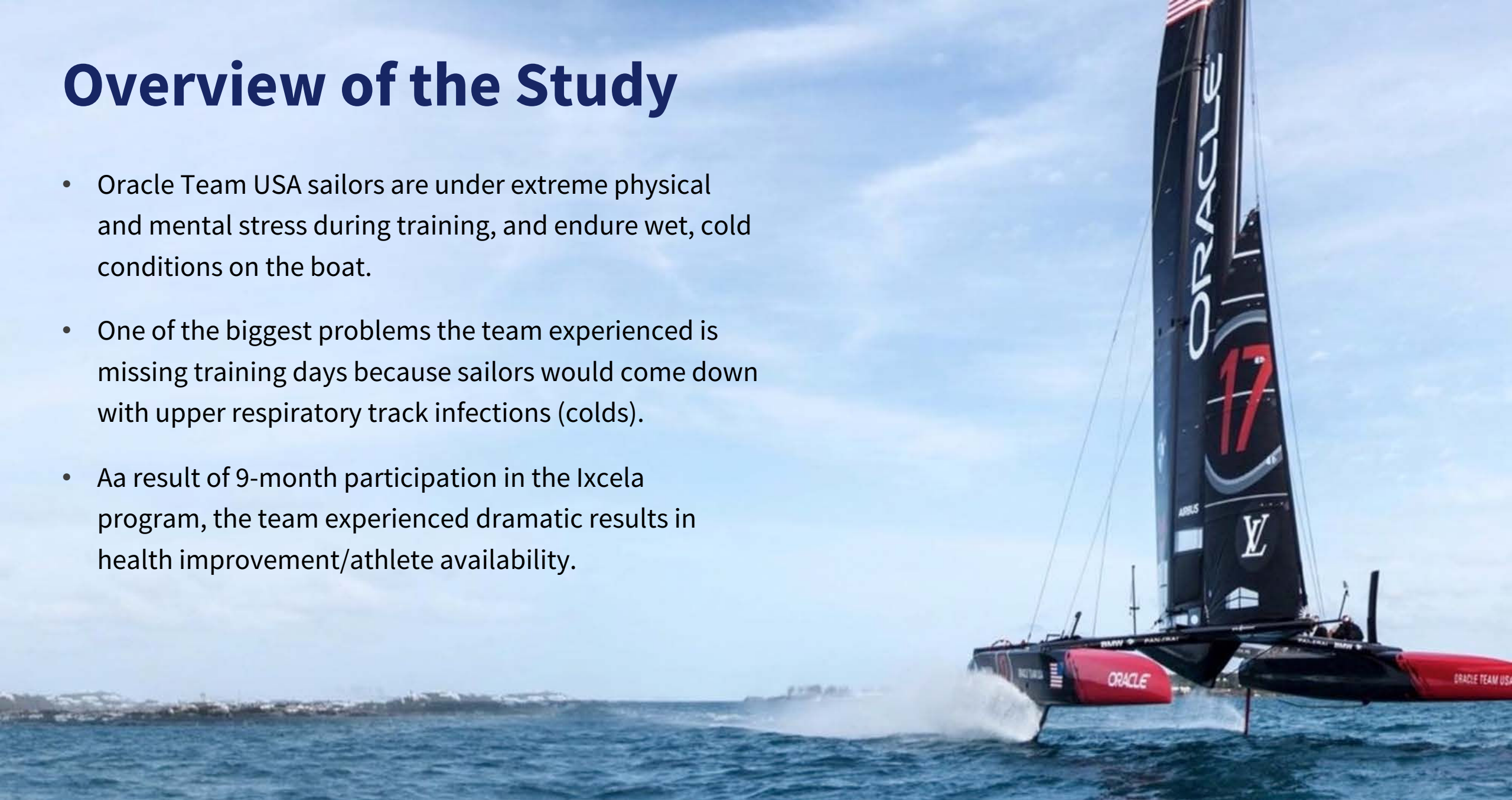


9-MONTH PILOT STUDY

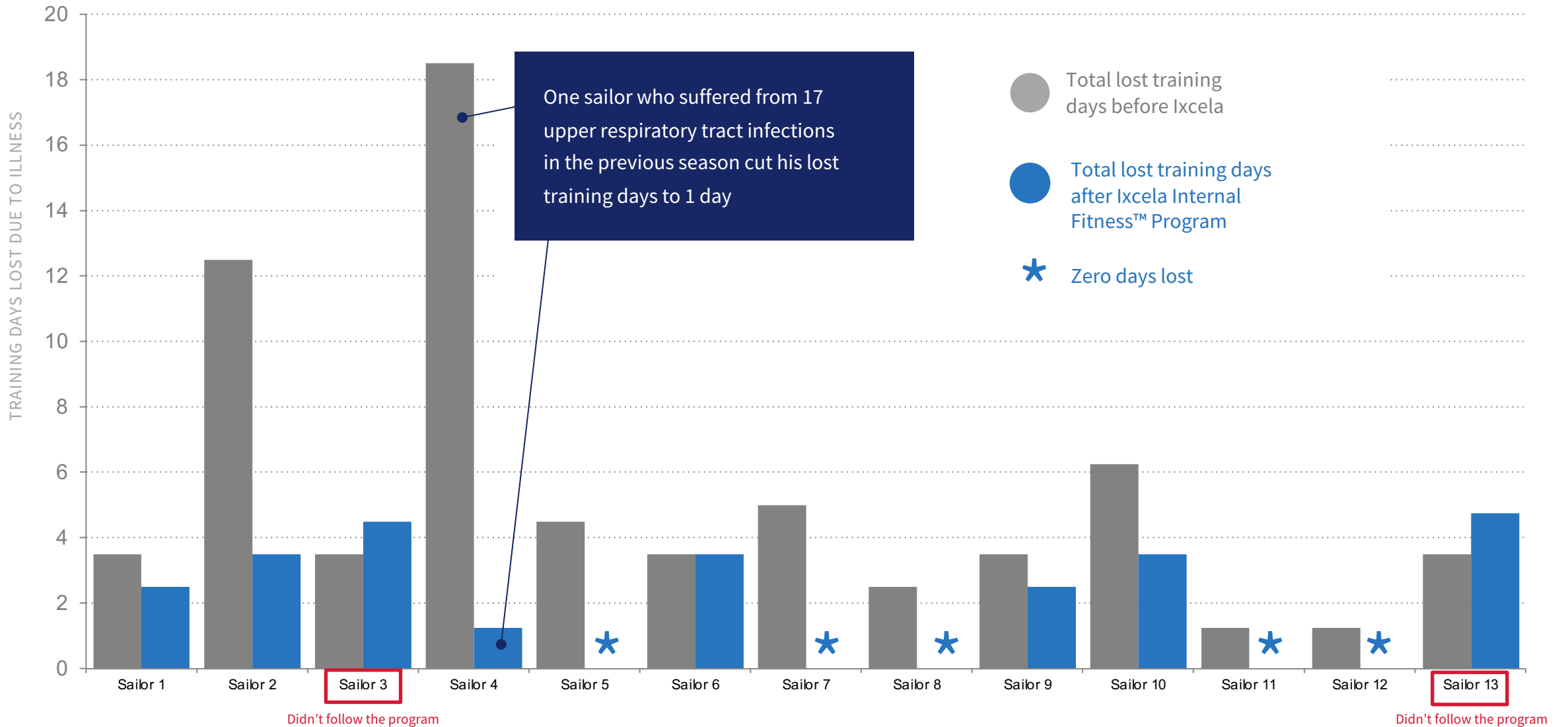
America's Cup Oracle Team USA

Overview of the Study

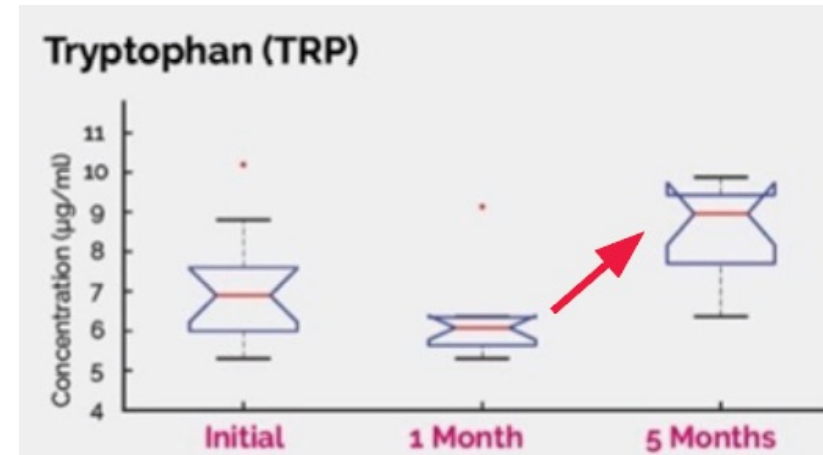
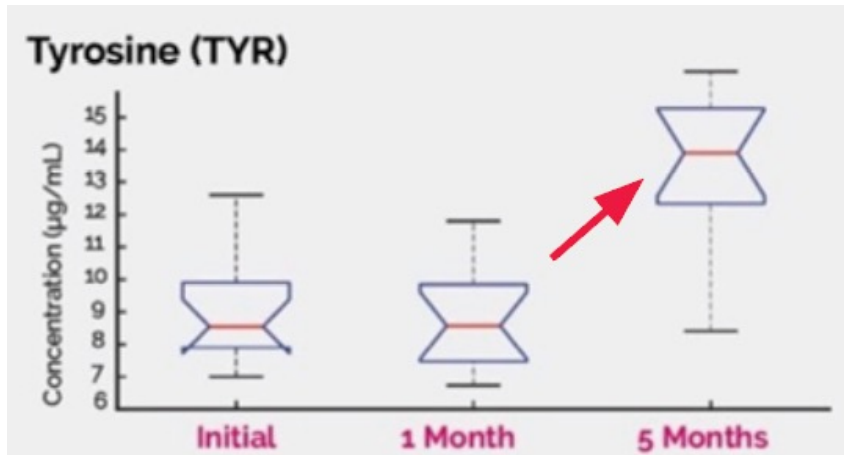
- Oracle Team USA sailors are under extreme physical and mental stress during training, and endure wet, cold conditions on the boat.
- One of the biggest problems the team experienced is missing training days because sailors would come down with upper respiratory track infections (colds).
- As a result of 9-month participation in the Ixcela program, the team experienced dramatic results in health improvement/athlete availability.



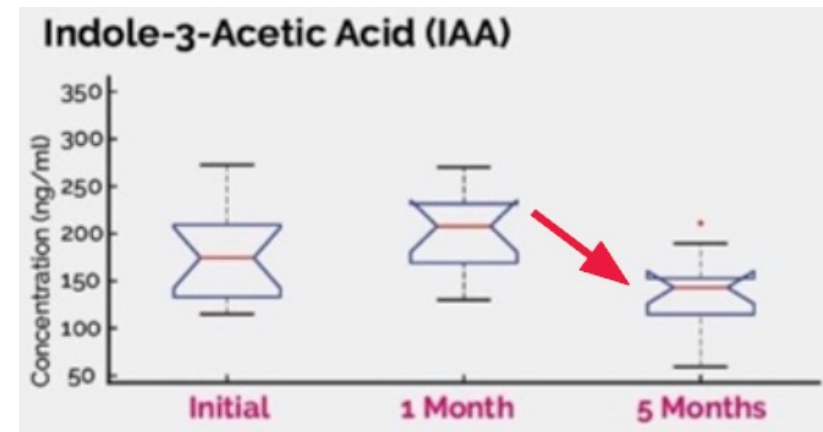
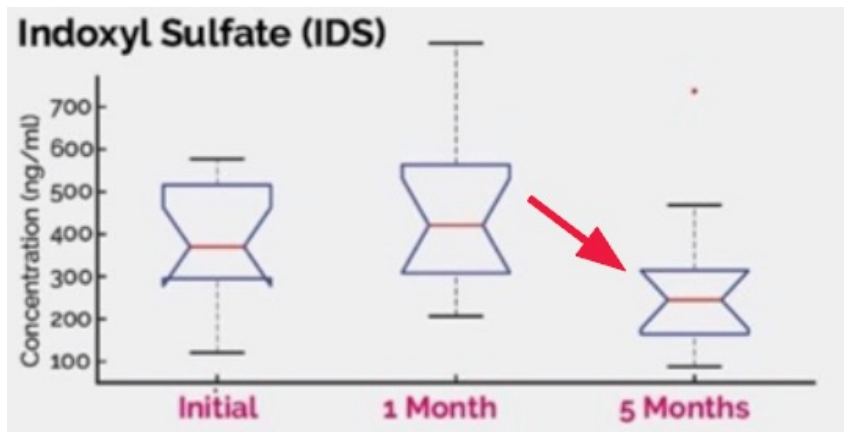
Ixcela program results for Oracle Team USA



Recovery metabolites increased after Ixcela



Damage metabolites decrease after Ixcela



The program results

30%

REDUCTION OF
INCIDENCE OF UPPER
RESPIRATORY TRACT
INFECTIONS

47.5%

INCREASE IN
SAILING
AVAILABILITY

54%

INCREASE IN
DAYS GAINED FOR
TRAINING

90-DAY PILOT

Mental Performers Program

Testing + Monthly Dietitian Guidance



Stress & Anxiety Case Study

- A 32-year-old accomplished author, business owner, and speaker was experiencing poor sleep, stress, brain fog, and chronic injuries. Chris was finding himself on the verge of burnout at work and feeling fatigued and unmotivated to exercise and choose good nutrition.
- For Chris to successfully build his business and achieve his personal fitness goals, he needed to find a way to be more focused and productive at work while also having better recovery from workouts.

100%
**DECREASE IN
TROUBLE FALLING
ASLEEP**
BEFORE: 9 NIGHTS/MONTH
AFTER: 0 NIGHTS/MONTH

Ixcela testing revealed primary actions needed were:

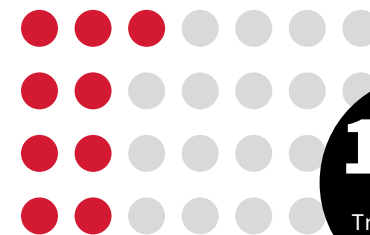
- ✓ Drink swaps
- ✓ Nutrition swaps
- ✓ Mindfulness

BEFORE: 9 Nights/Mo

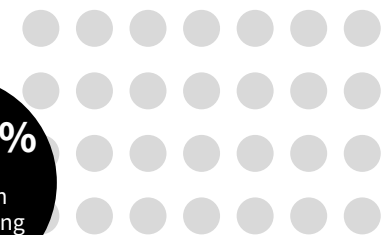


AFTER: 0 Nights/Mo

Trouble falling asleep



Trouble falling asleep



100%
Decrease in
Trouble Falling
Asleep



Project Manager Becky

- As a 51-year-old project manager, outdoors enthusiast, and weekend adventurer, Becky came to Ixcela, primarily because poor sleep and chronic pain had begun to affect every aspect of her life.
- Although Becky felt that she was generally healthy, she had low energy, debilitating joint pain, and reduced motivation. Furthermore, she had been feeling “low,” and she had recently begun to struggle with brain fog, trouble managing daily stress, and reduced productivity at work.

53%
DECREASE IN WAKING UP DURING THE NIGHT
BEFORE: NIGHTLY
AFTER: ~13 NIGHTS / MONTH

Ixcela testing revealed primary actions needed were:

- ✓ Nutrition swaps
- ✓ Sleep hygiene
- ✓ Supplements

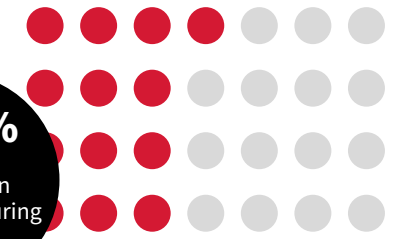
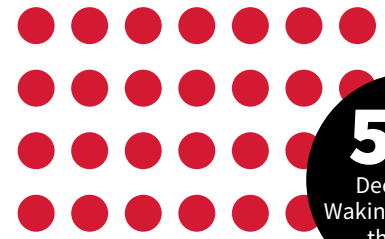


BEFORE: Nightly

AFTER: 13 Nights

Number of Nights Waking Up During the Night

Number of Nights Waking Up During the Night



53%
Decrease In Waking Up During the Night

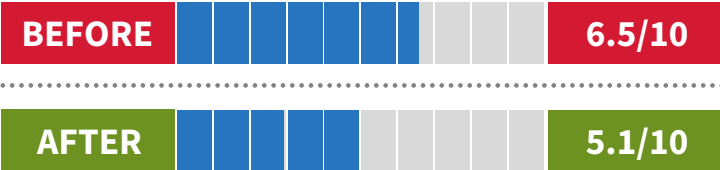


58%
DECREASE IN FEELINGS OF STRESS
BEFORE: Rated 6.9 out of 10
AFTER: Rated 2.9 out of 10



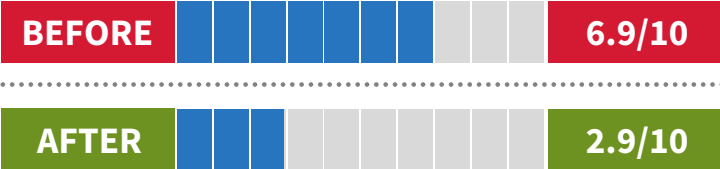
20%
Decrease in Fatigue

Average Level of Fatigue



58%
Decrease in Feelings of Stress

Average Mental and Emotional Stress



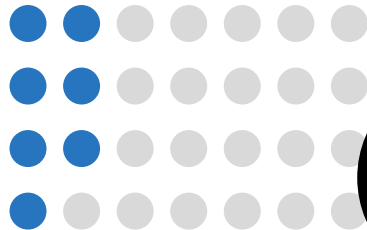


BEFORE: 1-2/Wk (30 min)

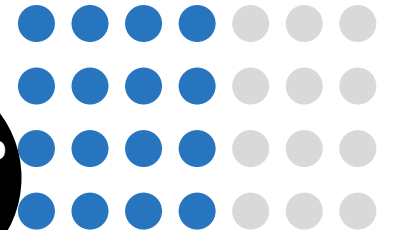


AFTER: 4/Wk (45 min)

Number of Days with Energy to Exercise



Number of Days with Energy to Exercise



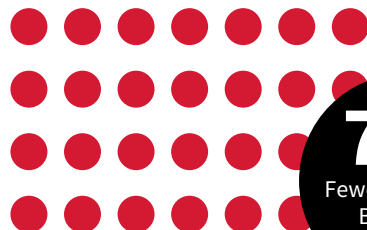
129%
Increase in Days Exercised

BEFORE: Daily

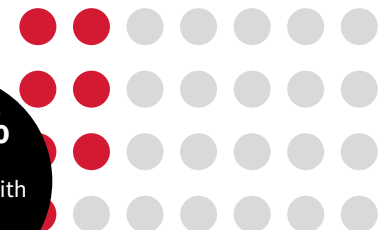


AFTER: 1-2/Wk

Number of Days with Brain Fog Per Month



Number of Days with Brain Fog Per Month



77%
Fewer Days with Brain Fog Per Month



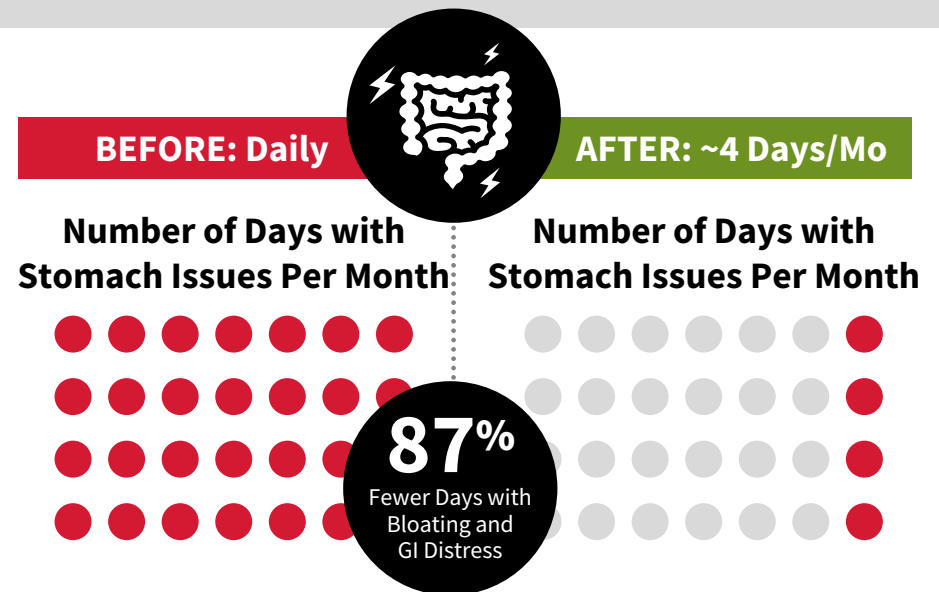
Sleep Issues Case Study

- Before this senior performance director found Ixcela, GI distress made her feel like she could no longer trust her body.
- To further complicate her struggle, she had trouble sleeping, she felt stressed, and she found it difficult to keep up with her demanding work schedule, which frequently required traveling and eating on the go. To be an effective coach and pursue her own athletic endeavors, she needed clear data and guidance about her health—and she needed to start feeling better.

87%
FEWER DAYS WITH BLOATING AND GI DISTRESS
BEFORE: DAILY
AFTER: ~4 DAYS/MONTH

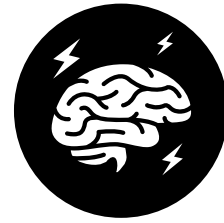
Ixcela testing revealed primary actions needed were:

- ✓ Nutrition swaps
- ✓ Drink swaps
- ✓ Restorative yoga



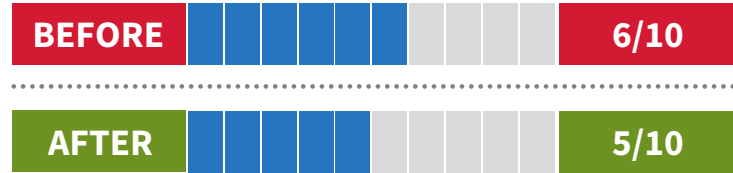


87%
**DECREASE IN
WAKEFUL NIGHTS**
BEFORE: NIGHTLY
AFTER: 4 NIGHTS/MONTH



17%
Decrease in
Reported
Stress

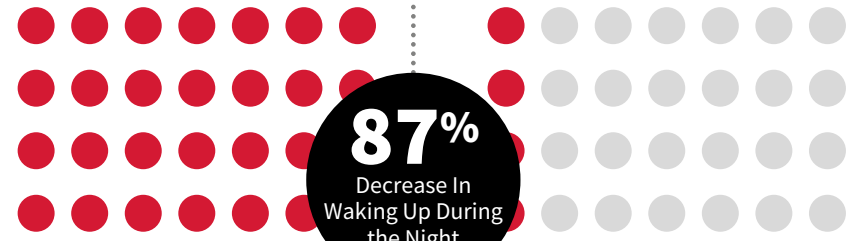
Average Stress Level



BEFORE: Nightly AFTER: ~4 Nights/Mo







Number of Nights Waking
Up During the Night

Number of Nights Waking
Up During the Night



87%
Decrease In
Waking Up During
the Night

I've been through test after test, why Ixcela?

Other Tests (\$-\$\$\$\$\$\$+)	Ixcela's Testing and Dietitian Programs (\$-\$\$\$\$\$)
<p> Standard blood panel \$-\$\$\$\$\$ (Ex: Inside Tracker)</p> <p>Vitamin and nutrient deficiencies could be a gut microbiome problem</p> <p>Standard biomarkers don't provide insight on how to alleviate runner's gut or food sensitivities</p>	<p> Unique athlete metabolites you can't get at your doctor or from standard labs</p> <p>11 unique metabolites all related to the health of the gut microbiome</p> <p>This sort of testing program was limited to elite human performance training facilities and is now available directly through Ixcela</p>
<p> Stool test \$\$-\$\$\$\$ (Ex: Viome, Biohm, GI-MAP)</p> <p>"Scoop" method of sample collection has accuracy challenges</p> <p>Nutrition interventions based on stool testing has many scientific challenges</p> <p>It doesn't provide insight on functionality of the gut</p>	<p> Uses blood—the gold standard in consistency and accuracy</p> <p>The 11 metabolites Ixcela tests are well-studied and backed by scientific literature to be modifiable by nutrition, supplements, exercise, and mindfulness practices</p> <p>The most advanced technology for measuring the functionality of the gut microbiome</p>
<p> DNA test \$-\$\$\$ (Ex: DNAfit)</p> <p>DNA tests can only tell you what you're predisposed to—not what's currently happening</p> <p>DNA is about risk—not if that risk as materialized (Ex: High cholesterol)</p>	<p> Measures your body's current state.</p> <p>Find out if your gut microbiome is damaged or imbalanced, if you're missing key nutrients in the diet, if your body is keeping up with your training and stress load, and if poor recovery could be contributing to symptoms</p>

Ixcela is different:

- ✓ **It's accurate and useful.** No one else measures of the functional state of the gut using a pinprick blood sample. It's the latest in gut health technology to advance human performance.
- ✓ **It's easy.** No phlebotomy. No stool collection. The Ixcela test is a simple pinprick sample of blood taken at home.
- ✓ **It's fast.** While other tests take 1–3 months to process, your Ixcela results post within 10 days.
- ✓ **It includes a dietitian.** You're not left on your own to figure out what to do like other testing companies. A licensed registered dietitian explains your results and guides what to prioritize based on your goals, data, and willingness to change.
- ✓ **It works.** As shown in our pilot studies, the Ixcela program is effective and changes people's lives and performance.
- ✓ **There are always ways to improve.** Even if you've taken other tests in the past and been told everything is “normal” but you don't feel good, Ixcela testing paired with expertise from our RDNs is different. You will always be given targeted nutrition and/or lifestyle changes that you can do to feel better.

**While other products seem generic,
Ixcela is highly personalized.**

Here are athlete protocol comparisons to
demonstrate what we mean.



77%
**FEWER DAYS WITH
STOMACH ISSUES**

BEFORE: DAILY
AFTER: ~7 DAYS/MONTH

Food Changes

- Switched race fueling from Hammer to SKRATCH
- Low FODMAP carb-loading plan 3 days leading up to a race
- Started taking supplements Ixcela Protect (NAC+ L-Methionine + Selenium) and Ixcela Defend (Vit C + Zinc)

Drink Changes

- Started electrolytes outside of training

Recovery Changes

- He took 1 scheduled rest day per week (previously, he wasn't resting on his rest day)
- Got into bed 2 hours earlier to get 8 hours of sleep daily
- Incorporated wind down exercise to help him fall asleep faster



87%
**FEWER DAYS WITH
GI DISTRESS**

BEFORE: DAILY
AFTER: ~4 DAYS/MONTH

Food Changes

- Stopped skipping meals or snacks
- Added post-workout protein shakes or chocolate milk paired with a bagel

Drink Changes

- Started drinking tart cherry juice daily
- Reduced coffee to one cup per day
- Drank 20 ounces of water 30-min before, during, and 60 min after a run

Recovery Changes

- Walked and stretched after her intense workouts (about 2 days/week)
- Included calming music and meditation before bed
- Got into bed earlier to get at least 7 hours of sleep daily



Food Changes

- Changed breakfast to include more carbs, fermented foods, and protein. (Ex: Went from eating a protein bar to eating rolled oats, Greek yogurt, and berries)
- Switched to a more strategic carb-loading plan 3 days before the race

Drink Changes

- Including additional electrolytes at 3pm before working out
- Adding tart cherry juice daily for a week leading up to a race

Recovery Changes

- Set an alarm on her phone to get into bed by 11pm
- Taking Ixcela's Biome Support (performance probiotic), as well as our antioxidants blends



Food Changes

- Stopped skipping lunch! Had at least a vegan protein bar or shake to accommodate his busy schedule.
- Add a granola bar, cereal, bagel, or banana 30 min before his workout

Drink Changes

- Previously was having 300-500mg caffeine, now aiming to stick to <300mg caffeine daily by cutting out afternoon coffee
- Added INFINIT sports drink to his intra-training hydration and added 20-40oz water right after his training.

Recovery Changes

- Paid attention to his Whoop data. If recovery was in the red zone, he would sleep-in or prioritize restorative activities that day



The Internal Fitness™ Company

Have questions?

Contact Samantha Nienow, CMO
at snienow@ixcela.com or visit
ixcela.com



Ixcela tests metabolites that fall into 3 pathways:

Tryptophan Pathway

- Intestinal permeability (IPA)
- Bloating, gas, cramping (IPA, IAA, ILA)
- Sleep (TRP, SER)
- Body temperature (SER)
- Brain fog / Mental clarity (TRP, SER)
- Anxiety, depression, mood (TRP, SER)
- Gut motility - Diarrhea, constipation (SER)
- Energy levels (TRP, KYN, IDS)

Tyrosine Pathway

- Initiative, motivation (TYR)
- Feelings of happiness and wellbeing (TYR)

Purine Pathway

- Fatigue and prolonged soreness
- Inflammation (UA, XAN)
- Physical, mental, and emotional stress (XAN, 3MX, UA, IDS, KYN)

- | | | |
|---------------------------------|-------------------------------|--------------------------|
| • Indole-3-Acetic Acid (IAA) | • Serotonin (SER) | • Uric Acid (UA) |
| • Indole-3-Lactic Acid (ILA) | • Total Indoxyl Sulfate (IDS) | • Xanthine (XAN) |
| • Indole-3-Propionic Acid (IPA) | • Tryptophan (TRP) | • 3-Methylxanthine (3MX) |
| • Kynurenine (KYN) | • Tyrosine (TYR) | |

Ixcela metabolite testing helps inform interventional techniques by answering:

Do we need to address intestinal permeability or a dysbiosis?

- Indole-3-propionic acid
- Indole-3-lactic acid
- Indole-3-acetic acid

Do we need to focus on getting key nutrients in their diet?

- Tyrosine
- Tryptophan
- Serotonin
- Kynurenine ↓
- Total indoxyl sulfate ↓
- Uric acid ↓

Do we need to focus on reducing stress and inflammation?

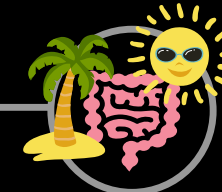
- Uric acid ↑
- Xanthine ↑
- 3-methylxanthine ↑
- Kynurenine ↑
- Total indoxyl sulfate ↑

Indole Pathway

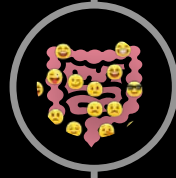
~5% of tryptophan goes into the **indole** pathway



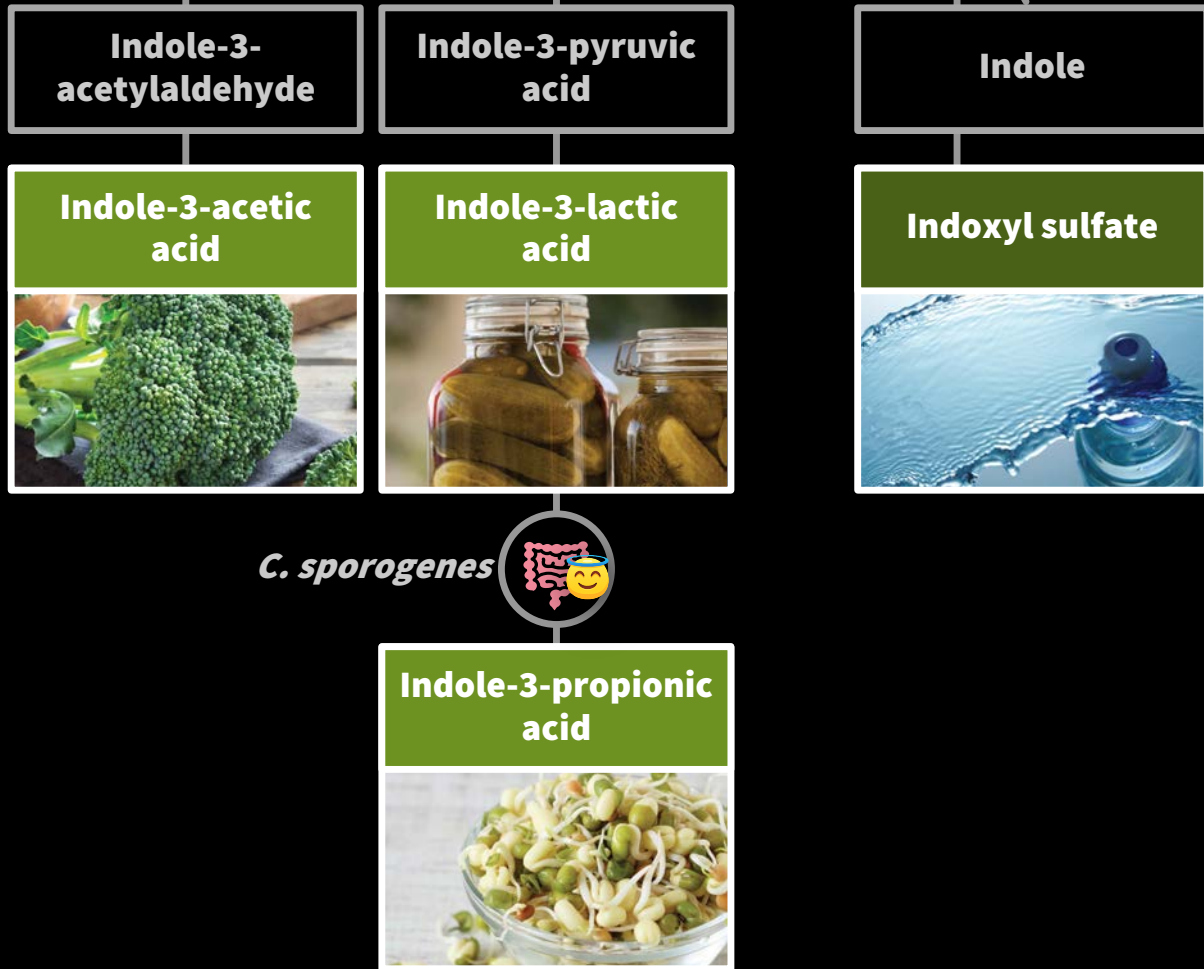
Tryptophan



Gut Environment



Gut Microbiota



Kynurenine Pathway

~ 95% of tryptophan goes into the **kynurenine** pathway

N-Formylkynurenine

Kynurenine



Serotonin Pathway

~ 1-2% of tryptophan goes into the **serotonin** pathway

5-Hydroxytryptophan (5-HTP)

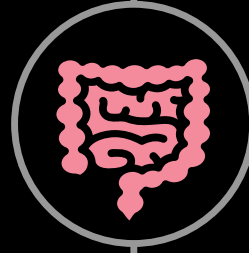
Serotonin



Melatonin ^{zzz}



Tyrosine



p-Tyramine

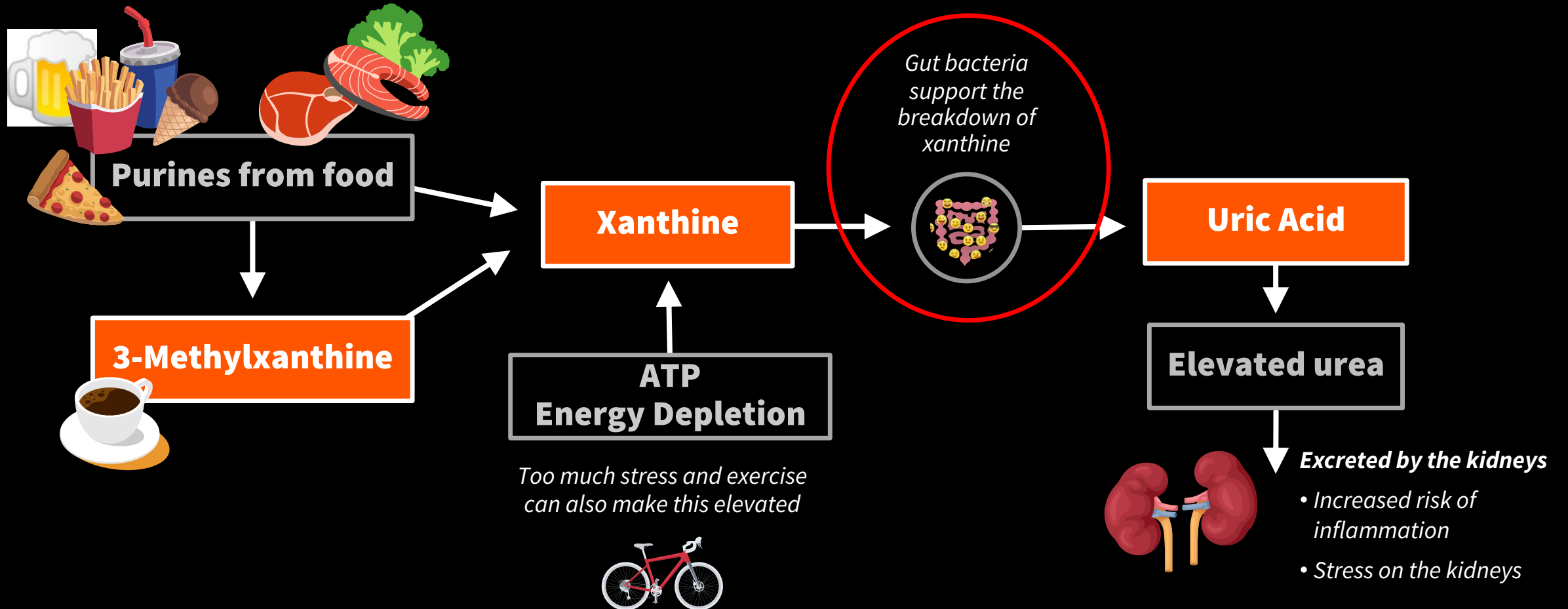
Dopamine

Norepinephrine

**Epinephrine
(Adrenaline)**

Purine Metabolites

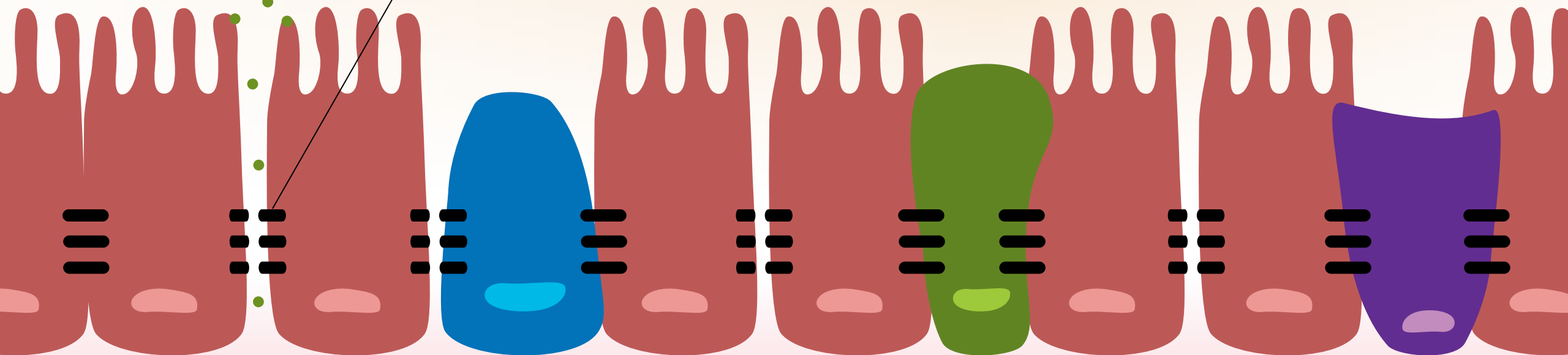
(Markers of stress and inflammation)





Bacteria break down food (Ex: Taco)

• Broken or loosened junctions in the lining of the gut



• **Intestinal Permeability (Leaky gut)**

- Can lead to allergies, food sensitivities, and autoimmune conditions
- Immune system confuses food for foreign invaders