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Unlocking Optimal Health — The Science Behind Low-PUFA Diets and Sustainable Eating

Analysis by Dr. Joseph Mercola | January 04, 2026

STORY AT-A-GLANCE

- Ashley Armstrong, co-founder of Angel Acres Egg Co., advocates for low-PUFA dietary options and draws inspiration from Ray Peat's bioenergetic medicine, challenging conventional nutrition teachings
- Through personal health struggles, Armstrong discovered the importance of monitoring metabolic markers like body temperature. By shifting from restrictive diets to a metabolism-focused lifestyle she was able to regain her health
- Cellular energy is the cornerstone of health, and low-carb diets fail to provide adequate fuel for optimal energy production and cellular function
- High-PUFA diets promote ill health. Avoiding PUFAs such as linoleic acid (LA) and limiting your omega-3 intake is an important first step, as all PUFAs are highly susceptible to oxidation and disrupt glucose metabolism
- Other key contributors to low metabolism and suboptimal energy production are estrogen and xenoestrogens from plastic, endotoxins, and electromagnetic fields

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This interview features repeat guest Ashley Armstrong, co-founder of Angel Acres Egg Co., which specializes in low-PUFA (polyunsaturated fat) eggs, and the Nourish Cooperative, which provides low-PUFA pork, beef, cheese made with natural animal

rennet, A2 dairy, and traditional sourdough. She's also a contributing author to this newsletter once a week.

Armstrong and her sister, Sarah, are strong advocates of the late Ray Peat's work, a biologist and pioneer of bioenergetic medicine. It transformed both of their lives, and she shares some of that story in this interview. We also clear up some of the confusion surrounding these principles which, rather radically in some cases, differ from what I've previously taught and what many in the field of nutrition teach today.

Energy Production Is at the Heart of Health

> *"Health is too complicated for people these days,"* Armstrong says. *"My purpose in the health space is to uncomplicate things, like, take a step back and really make people reflect, 'Do these things make sense?' You don't need to go plunge into cold ice water baths every single day to get optimal health. That doesn't make sense. We don't have to go to these extremes to achieve health.*
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> *There are many things working against us. The food system is working against us, our environment is working against us, that's for sure. But in pursuit of health, people are often drawn towards extremes because people promise quick fixes. And I understand the idea of a quick fix is very enticing. But we have to understand that quick fixes often come with long-term consequences.*
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> *So, if something in the short-term may feel great because it may suppress a symptom, if we aren't in tune with our health, that could come with long-term consequences. And this is where we see a lot of people today. They may have made a dietary switch away from the standard American diet, which is always a great first step. But if we aren't in tune with metabolic markers, we could be going down the wrong path."*

Once you've studied molecular biology, there's no other rational conclusion than your ability to create energy in your mitochondria is the primary, foundational key to optimal health. Every cell in your body requires energy to perform their intended function, and

when energy is insufficient, ill health is the result. So, the foundational cure to every disease is plain enough. It's to optimize cellular energy production. The question is how.

Fats Inhibit Optimal Metabolism

Like many, I used to believe glucose was an inferior fuel to dietary fat, when in fact it's the complete opposite. Similarly, while many understand that processed foods aren't good for you, most lay the blame on sugar, when in fact it's the seed oils that do most of the harm.

Sure, refined sugar in high amounts is not healthy, but even refined sugar isn't as bad as polyunsaturated fats (PUFAs) and to a slightly lesser degree, monounsaturated fats (MUFAs). After delving deep into Peat's work, it's clear that eliminating seed oils is a key measure for optimal health.

This includes not only oils from seeds but also all types of whole seeds and nuts, including macadamia nuts. I previously recommended macadamia, as they're low in LA. However, they contain substantial amounts of oleic acid, a MUFA, which is nearly as damaging as LA thanks to its unsaturated nature, characterized by the double bonds in its chemical structure.

Even omega-3 can be problematic in high amounts. The reason? Because, like LA, it's a PUFA. What makes PUFAs so problematic is their double bonds, which make them prone to oxidation. The omega-3 alpha linolenic acid (ALA) has three double bonds, eicosatetraenoic acid (EPA) has five, and docosahexaenoic acid (DHA) has six. For comparison, LA only has two.

All three omega-3s are known for their strong anti-inflammatory effects, which are instrumental in preventing and managing conditions like cardiovascular diseases, arthritis, and other inflammatory conditions.

However, because omega-3 fats are highly unsaturated, they're also highly susceptible to oxidation, which can lead to the formation of harmful free radicals that contribute to oxidative stress and cellular damage. So, like other PUFAs, they can have a negative effect on glucose metabolism when taken in excessive amounts.

As explained in far greater detail in previous articles, if you eat too much dietary fat, your body ends up favoring fat metabolism at the expense of glucose metabolism, and burning glucose in your mitochondria is the pathway that creates the greatest energy production. So, excessive fat intake actually results in suboptimal energy production.

Ashley's Personal Experience

Armstrong comments:

> *"I was looking for help because my health was not good. I eventually went down the keto, carnivore, fasting path. I can thank my sister Sarah, for waking us up to this. She said, 'Ashley, let's measure our body temperature today.'*
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> *I was like, 'This is weird. Why would you ever do that?' Even though when you look back at like old-school medical textbooks, body temperature was used as a sign of health for so long. That tradition has been lost.*
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> *And so, we measured our body temperatures, and my thermometer said 96.3 degrees Fahrenheit. It should say 98.6. That was the first time I woke up to the idea of metabolism, as a way to objectively measure whether or not health is moving forward, or if we're going backwards. Because symptom suppression lowers your metabolic rate.*
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> *Lowering the metabolic rate is a survival mechanism for humans because when energy reserves are low, when we don't have the proper amount of micronutrients, it's the body's way of making sure that we're going to stay alive. If it were to push metabolism when you're in a restricted state, you would die.*

You wouldn't have enough energy; you wouldn't have enough reserve. Think about when a squirrel goes into hibernation. It's not advantageous for that squirrel to have a high metabolic rate while it's trying to hibernate over the winter months. It would die because it would run out of resources.

And so, when my body was in that very low metabolic state, low body temperature state, it was literally screaming, 'surviving not thriving.' That was my wake-up moment. I realized that metabolism is a way to gauge your health, not these random dietary rules that someone on the internet was telling me to do.

A famous quote by Dr. Ray Peat is, 'The main goal is to keep the metabolic rate up.' And there are many ways to do it. I love that because there's not a single, exact path to get the metabolic rate up. What Dr. Mercola eats every day is different than what I eat every day. We all have different gut health; we all have different sun exposure.

But using simple metabolic markers frees you up. It's so much simpler to use body temperature measurements as a way to assess metabolic health rather than staying below 10 grams of carbohydrates … these are arbitrary rules.

It's been so freeing, learning about metabolism. It makes eating so much more pleasurable because you can eat so much food. I have sourdough bread every day. I have dark chocolate, orange juice, fruit, on top of dairy and meat and all these things.

When you view health as metabolism-focused, you get rid of these silly dogma things. That's why I like to talk about it because I don't want people living in this restrictive path. It's not a fun way to live. And you don't have to do these restrictive things.

My sister and I got so obsessed with this that we spent two years developing a course, because we just wanted to scream it from the rooftops. I went from being a full carnivore to now being able to enjoy such a wider variety of foods

and not feel bad about it — and see my health improve in that process …

I don't want to discredit the fact that it's a little bit harder to be healthy today relative to the 1900s. But if we stress out about these things, it's just going to make our health worse. Something that's important to know is, the better your metabolism, the healthier your liver is, the better your body can detox.

Truly, the best way to [detox] is to have a healthy metabolism, where your liver can help you do that. Of course, the food system is severely messed up. And that's why I think finding a source is producing food how it was supposed to be produced. I think that food sourcing is important."

Simplify, but Remember That the Devil's in the Details

Indeed, one key simplification that will take you a long way is to ditch all processed foods and only eat real food, meaning whole, minimally processed food. The next step is to fine-tune your food choices by understanding that how a food was grown, raised, or made, affects its nutrition and ability to promote health.

Take cheese for example. As Armstrong details in "**Genetically Modified Ingredients in Most US Cheeses**," cheese made with GMO rennet is nothing like cheese made with traditional animal rennet.

Similarly, while olive oil has a long history of veneration, most olive oil sold today is adulterated with cheap seed oils, and even if you find unadulterated oil, its high oleic acid content still makes it inadvisable to consume it in high amounts.

Patent-Pending Personalized Health Tutoring Under Development

As mentioned, Armstrong and her sister have developed a course called Rooted in Resilience. This course is the culmination of their personal health experiences and insights into metabolism, inspired by Peat's work.

The course not only provides theoretical knowledge but also practical tools to apply these principles in everyday life. The content is intended to make health concepts accessible and manageable, steering clear of quick fixes and emphasizing sustainable health practices through better understanding of bodily functions and nutritional impacts.

Energy Production and Gut Health Go Hand-in-Hand

Understanding the importance of gut health is crucial, as it forms the foundation of your overall well-being. A healthy gut microbiome can influence everything from energy production to immune function, so it’s a central element in maintaining health and preventing disease.

Your gut is like a complex highway system where different pathways are designed to ensure that your body efficiently makes the energy it needs. However, when this system faces blockages or disruptions — often caused by diet choices like high PUFA intake — it can lead to reduced energy availability, and that ultimately affects your gut health.

When your gut isn't working as it should, it often stems from a low metabolic rate. This slows down your gut's ability to process and clear out waste effectively. As a result, food lingers longer than it should, which encourages the growth of harmful bacteria and the production of endotoxins.

Additionally, a compromised metabolic rate can lead to an oxygen-rich environment in your gut. This change in oxygen levels shifts the balance of bacteria, allowing facultative anaerobes — bacteria that thrive in oxygen — to outcompete the beneficial anaerobes that prefer oxygen-free conditions.

These facultative anaerobes are often pathogenic and can trigger gut inflammation and other diseases. They produce damaging substances like endotoxins, which can harm the gut lining and cause broader health issues if they leak into the bloodstream.

This also helps explain why some treatments such as hyperbaric therapy and rectal ozone insufflation may be ill-advised. While the boost of oxygen supply to tissues can enhance healing in the immediate term, this elevated oxygen can also drastically alter your gut environment for the worse.

4 Key Contributors to Poor Mitochondrial Energy Production

As detailed in the interview, there are four key contributors to poor mitochondrial function, each of which plays a significant role in diminishing cellular energy production. The first is LA, a type of PUFA commonly found in industrial seed oils. Introduced into diets around the 1870s, LA has been increasingly implicated in the disruption of cellular processes.

Next is estrogen and related compounds such as BPA, found in plastics. These xenoestrogens mimic natural estrogen in your body, binding to the same receptors and triggering similar biological responses. Their prevalence in the environment and food chain has grown alongside industrial advancements, posing a significant threat to mitochondrial integrity.

The third contributor is endotoxins — toxic substances released from the outer membranes of pathogenic gut bacteria when they die. These toxins are particularly harmful when your gut health is already compromised, as low integrity in your gut lining (leaky gut) allows more endotoxins to enter your bloodstream, thereby further impairing mitochondrial function.

Electromagnetic fields (EMFs) are the fourth contributor. Common in modern environments due to wireless technology and various electronic devices, EMFs have been shown to interfere with cellular signaling and exacerbate mitochondrial dysfunction.

Each of these four culprits — LA, estrogen, endotoxin, and EMF — have a central mechanism of action by which they destroy your energy production. Each causes an influx of calcium into the cell, which increases superoxide and nitric oxide production.

Superoxide and nitric oxide, in turn, react to form a reactive nitrogen species called peroxynitrite, which do most of the damage. As noted by Armstrong:

> *"In a well-functioning gut, we've got a really nice gut lining barrier with selective permeability. Also, the inside of the gut has high levels of CO_2 [carbon dioxide] and low levels of oxygen. It's important for people to understand that the levels of gases inside your gut will change your microbiome balance. So, internal environment impacts function. And internal environment is impacted by systemic energy production.*
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> *So, you must have systemic energy production to have the right function. You see all these people trying to manipulate their microbiome. But if you don't change the internal environment, it's just going to go straight back to what it was before, or it's going to continue. It's going to require you to continuously do these things over and over and over again, rather than fixing the root cause.*
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> *In someone who has a low metabolic state, high oxygen gut, leaky gut, food particles that aren't broken down can leak through the gut lining and cause a lot of systemic problems. GI distress, inflammation, endotoxemia.*
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> *And so, for people in a very low metabolic state with a lot of gut problems, you got to be careful about what food you are consuming until you heal and seal your gut, until you fix your metabolism.*
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> *Eat the foods that cause the least amount of problems, but make sure that you're eating enough of those. Eating 1,200, 1,300, 1,400 calories is not going to fix your metabolism. If you're chronically eating low-calorie, your body is recognizing it's a time of scarcity, 'I need to down regulate metabolism to make it through the winter.'*
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> *That's just what your body is thinking. So, the amount of food you eat is important. So, finding what foods you tolerate, and eating as much as you can of those while working on improving your metabolism, over time, you'll be able to regain function.*

As long as you're working in parallel with improving your body temperature and pulse measurements, and in boosting your metabolism, you should be able to tolerate more and more food over time."

Suboptimal Energy Is the Root Cause of Leaky Gut

Leaky gut syndrome presents a complex challenge where increased oxygen in the gut favors pathogenic, or disease-causing, bacteria over beneficial ones. These beneficial bacteria are crucial because they process dietary fibers to produce short-chain fatty acids such as butyrate. Butyrate serves as a primary fuel source for the cells lining the gut, helping to maintain and repair the gut barrier.

So, the presence of beneficial bacteria like obligate anaerobes, which thrive in low-oxygen environments, is essential. These bacteria not only help digest fibers but also participate in a process called beta oxidation — a metabolic mechanism that consumes oxygen and helps reduce its levels in the gut. This reduction in oxygen mitigates the conditions that favor the growth of harmful, oxygen-tolerant bacteria.

Furthermore, the beneficial bacteria produce substances that physically seal the gaps in the gut lining, preventing unwanted substances from leaking into the bloodstream. This local production of butyrate and other beneficial compounds ensures that repair and maintenance of the gut barrier are efficient and targeted, happening right where it's needed.

Thus, maintaining a balance of these beneficial bacteria is key to a healthy gut. When they flourish, they enable you to digest a broader range of foods, as they help break down all sorts of foods.

This is why some people can eat starch and thrive while in others, starch only increases endotoxin production and contributes to premature death. They may even go into septic shock, and most sepsis is due to this chain of events. They have severe leaky gut and produce so much endotoxin, it goes systemic and turns into sepsis.

How to Rebalance Your Body

So, how do you rebalance your body so that energy production and gut health can be optimized? In short, address each of the four key culprits, starting with your LA intake. Key sources to be avoided include seed oils, all nuts and seeds, processed foods, fast food, and restaurant food, conventionally raised chicken and pork.

Next, lower your estrogen burden. In addition to avoiding estrogen therapy, progesterone is something most adults can benefit from, as it's anti-estrogenic. As noted by Armstrong, "the idea of supplementing progesterone is to, over time, push that estrogen out and have a better hormonal balance." Having less estrogen stored in your body is one thing that can boost and improve your energy production. Sauna and exercise will also help detox xenoestrogens from plastic.

Also reduce your EMF exposure as much as possible. Together, these strategies will help suppress endotoxin production by restoring energy generation.

Also, as mentioned, each of these have calcium disruption as a central mechanism of action, which leads to reductive stress, i.e., a buildup of electrons that slow down energy production. One of the best remedies for that buildup is CO_2, and there are several ways to boost your CO_2. For more details, see "**The Biology of Carbon Dioxide**."

Support Traditional Farmers

In closing, if you want to optimize your health, sourcing your food wisely is a primary concern. Farms and farmers have been under assault for some time, and the pressure to get big or get out is only getting worse. Between 2007 and 2020, 200,000 American farms closed.

Ashley and I are on a mission to reclaim the food system back to its original, where farmers are paid an honest wage to produce food the right way, so that the food provides the nourishment it's supposed to and none of the toxins. Angel Acres Egg Co. and the Nourish Cooperative are just the start.

"We're getting more farmers into the system," Armstrong says. *"We're slowly growing, but I'm not going to push Mother Nature, because then we would just be a confinement operation …*

In terms of my journey, step one was learning about metabolism. Then, once I learned about metabolism, I was like, okay, the body has to have the right food to fix itself. The body will if you give it the tools it needs. It's designed to regenerate. And in pursuit of the highest quality foods, I couldn't find what I was looking for, so then we were like, 'Let's just start a farm.'

And then, realizing that being a farmer is very hard, and the current conventional system is designed such that the big agriculture companies make a ton of money, and farmers make very little, and so of course quality is compromised. To survive financially, you have to do these other things.

Over 85% of farmers have to have an off-farm job to support their farm. They're all doing the best that they can, given the current structure, but no farmer is incentivized to do things that are beneficial for health. They're incentivized purely by yield.

If you can't find a good food source, it is hard to be healthy. But when you do find a good food source, supporting them as often as you can and giving your body those tools, that's how your metabolism is going to heal. And, truthfully, I think one of the biggest things that I have realized along my health journey is that where you source your fats is the most important.

Because the fats that you consume dietarily, they don't just they serve as structural components inside your body that impacts function. They also serve as energy, because some parts of your body use fat for fuel. They also serve as signaling molecules.

When LA is broken down, it produces these metabolites and those are serving as signaling molecules telling your body certain things. When a squirrel goes into hibernation and increases PUFA consumption, all these metabolites signal

to the body, 'Oh, it's hibernation mode, let's downregulate metabolism.'

That's happening across America. Americans are entering hibernation mode, because our food system has shifted from higher saturated fat to higher polyunsaturated fat, because that's what U.S. Dietary Guidelines is telling people to do …

America spends the least amount of money on our food relative to other countries. I think that's represented in how our farmers are compensated, and I think that it's going to take farmers being paid more to make a big shift in the food system."

So, a comprehensive answer to poor public health is twofold. First, we need to educate people about the bioenergetic implications of foods, and second, we need to change how food is grown and produced. Armstrong and I are dedicated to facilitate both of those things.

Transform Your Health — One Step at a Time

Learn More

Ashley and her sister Sarah have put together a truly groundbreaking step-by-step course called “Rooted in Resilience.” They have compiled what clearly is the best application of Dr. Ray Peat’s work on bioenergetic medicine that I have ever seen.

This has to be one of the absolute best values for health education I have ever seen. If you want to understand why you struggle with health problems and then have a clear program on how to reverse those challenges, then this is the course for you.

It is precisely the type of program I wish I would have had access to when I got out of medical school. I fumbled around for decades before I reached the conclusion they discuss in the course and share with you so you can restore your cellular energy production and recover your health.

- Select and eat the right foods to heal your metabolism and improve glucose utilization
- Balance your hormones to help reduce anxiety, weight gain, and sleep disturbances
- Use reverse dieting to increase your calories without gaining weight and tanking your metabolism, all while improving your energy levels
- Heal your gut for proper immune function, mood, and weight management
- Tweak your diet and lifestyle habits to improve your mindset and mental health
- Crush your fitness goals with ease and get your life back on track
- Master the most essential habits for health with bonus guides, including over 100 meal plans to take the stress out of meal time planning and shopping, and so much more!

Learn more about Rooted in Resilience here.

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