




THE KOOOP PLAN

By Ariella Gintzler
Photos by Fredrik Marmsater

WHO IS THE COACH
BEHIND TODAY'S
TOP TRAIL RUNNERS?



JASON KOOP, ONE OF ULTRARUNNING'S MOST SUCCESSFUL COACHES, works in a small, sparsely furnished space, where the shelves are filled with running clothes and the walls are covered in to-do lists and haphazard diagrams of feet. When I visit him there in November, I meet a lean, lanky 30-something wearing jeans, a denim button-up and blue running shoes. He towers over me, at nearly six feet tall. Brown hair lies thick across his forehead; sideburns reach down to his jaw, past prominent ears, framing a slightly oversized nose. The overall impression is that of a cross between Abraham Lincoln and Spock.



He folds himself into a chair behind two computer monitors displaying line graphs and scatter plots. “You can see here, Alex starts going uphill and his pace slows down, but his power actually goes up,” he says, taking his hand off of the mouse and tracing a pair of purple and blue lines with his finger. By “Alex,” he means recent Lake Sonoma 50-miler champion Alex Varner, who has just uploaded data from his most recent workout. Koop clicks a button and two more lines appear—cadence and temperature.

“I’d expect power output to be higher on the uphill than on the flats, but not to the extent that the power meter is calculating,” says Koop. “Just an example of working with emerging technology and knowing what data, good and bad, you are getting from it.”

He looks up from the screen. “I don’t know how much detail you are looking for. I could go on about this for hours.”

Koop’s roster of elite-level ultrarunners reads: Kaci Lickteig, Dylan Bowman, Mike Foote, Timothy Olson, Jen Benna, Larisa Dannis, Dakota Jones, Missy Gosney, Alex Varner, Ford Smith. In the last four years, these athletes have earned 48 podium finishes working with Koop, including three at Lake Sonoma, two at the Hardrock 100 and two at the Western States 100. Last September, three of the six medal earners at the Ultra Race of Champions 100K were coached by Koop. But Koop would never tell you that unprompted.

“I’m hesitant to list out all of their accomplishments,” he says. “Many of them were great runners before I started working with them.”

So who exactly is the man behind today’s top trail runners? If you don’t know, you’re not alone. Despite a solid ultrarunning resume of his own, including strong finishes at Hardrock, Western States and the Leadville Trail 100, Koop is rarely the one on the podium at such high-profile races.

“Jason is known for being a great coach because he has done great coaching,” says Jones, an elite trail runner who has worked with Koop since 2012. “Other coaches are known for being great coaches because they have been great athletes. That says a lot about him.”

KOOP HAS BEEN nearly six feet tall since the sixth grade. Fittingly, he began running on the basketball court. Growing up in Dallas, he could dunk by age 14. He could also complete conditioning drills faster than anybody else on the team, and, by high school, track had become his main sport.



Koop and second-year CTS coach Davis Bentley look at data from a recent workout.

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Conveniently, his grandfather owned a shoe store. National Shoes specialized in dress shoes, but Koop could order from any company he wanted. “Truckloads of loafers and Oxfords would arrive at the shop, and then there would be one box of running shoes at the bottom of the pile,” he recalls. “Everyone knew who the running shoes were for.”

After graduating, he ran on the track team at Texas A&M, where he worked toward a degree in chemistry and genetics. He quickly realized that a traditional science career was not for him. “It just wasn’t my bag, sitting behind graduated cylinders and pipettes, running things through a mass spectrometer,” he says.

Meanwhile, his passion for running had led to a summer coaching job with his old track team in Dallas. There, he fell in love with the coaching process, with “seeing athletes develop, helping them run faster, jump higher.” He returned to Texas A&M for his junior year newly determined to make a career as an endurance coach. The first step was to find a summer internship, preferably far from the Texas summer heat so he could continue to train. There were few options outside of high-school or college athletics. Then, while searching in the computer lab, he stumbled on a Colorado-based company called Carmichael Training Systems.

CTS had been founded a year earlier, in 2000, by former Olympic cyclist and U.S. Cycling coach Chris Carmichael. Carmichael had made a name for himself coaching Lance Armstrong, and his new coaching business was



Though Koop coaches his athletes remotely, they come to his office for testing. This mask measures the amount of oxygen and carbon dioxide an athlete breathes out during peak exertion, in order to calculate VO_2 max.

riding high after the star cyclist's 1999 Tour de France victory. (In a sworn statement he gave in 2013 as part of a lawsuit, Armstrong said Carmichael knew about his use of performance-enhancing drugs as early as 1995. Carmichael has denied this.)

CTS had only three other staff members, and was looking for an intern. Koop headed to Colorado Springs at the end of the semester.

He spent the summer learning from the other coaches, watching them break down and analyze training files and listening to how they communicated that information to their athletes. As the token runner at the office, he also spearheaded the development of the company's overall running strategy, from the field tests they used to assess new athletes to the heart-rate and pace ranges that accompanied each running workout.

"This had a big impact on me," he says. "I was forced to learn everything before actually implementing it in my own coaching."

Jim Rutberg, a CTS coach who serves as the company's media director, remembers Koop as a highly motivated intern with a strong grasp of science and a way of connecting with athletes.

"When Jason took on a project, you could count on him to deliver," he says. "He takes a very organized approach to

everything, from his own training to how he coaches his athletes." Koop wasn't assigned to oversee running strategy for CTS, says Rutberg. "He put his hand up and said, 'I can do this.' And we knew from experience that he could do a great job."

By August, Koop had gained enough experience to continue coaching for CTS on a contract basis from his dorm room at A&M. "I actually bought my first cell phone that summer so that I could coach people while finishing up school," he says. Upon graduation, in spring 2002, he moved back to Colorado Springs to join CTS as a full-time coach.

OVER THE NEXT SEVERAL YEARS, Koop's coaching skills grew. "I always had better coaches around me, pushing me to study more, become better and know my shit," he says.

With the exception of administrative personnel, CTS coaches don't have their own offices; they share a large, glass-walled space in the center of the building. The design is intentional, says Koop, allowing the coaches to eavesdrop on one another's conversations and hear the training plans that others are building for their athletes.

"That forces everyone in the room to be better," Koop says. "If someone gives the wrong workout or advice, they are immediately corrected. Bad coaching practice"—

misinterpreting workout data, say, or failing to build rapport with an athlete—“sticks out like a sore thumb.”

Koop worked with athletes across all endurance sports. Most of them he describes as “normal people” just looking to finish a marathon or century ride or PR in their next Ironman race.

Meanwhile, his personal love of running continued to flourish. Having grown up in the flatlands, Koop was amazed and inspired by the mountainous landscape of Colorado Springs. “Pikes Peak is practically in my backyard,” he says. “It was just a matter of time before I started to foray onto the trails.”

In September 2002, just a few months after moving to Colorado Springs, he ran the 17.1-mile Imogene Pass Run in Ouray, Colorado. He ran it again the following year, as well as the 12.6-mile Barr Trail Mountain Race on Pikes Peak. In 2004 he ran his first Pikes Peak Marathon.

“It was really just a classic evolution from running the 1,500-meter in high school and college to running a marathon,” he says. “I kept wondering if I could run the next distance, and the next one.”

CTS was still a small company, and Koop was one of the few coaches on staff with significant running expertise. As a result, the few runners that came to CTS were sent his way. In 2004 he began working with Salt Lake City native Jim Huffman. Koop describes Huffman as he does most of his athletes: “Just a normal dude with a day job and kids, running around like a chicken with his head cut off.” In 2006, Huffman placed fifth overall at Western States and second at Utah’s Wasatch Front 100.

“Before I started working with him, he just ran a lot, but he had capped out on the amount of improvement he could make by simply adding more miles,” Koop says. “I gave some logical structure to the whole plan.”

Also in 2006, well-known ultrarunner Dean Karnazes began working with CTS. Karnazes had gained widespread attention for such ballsy feats as completing a 199-mile charity relay solo, as well as for his popular book *Ultramarathon Man*, which came out that same year.

As one of Karnazes’ new coaches, Koop was assigned to crew him at the Badwater 135, a 135-mile race through Death Valley, and pace him for 40 miles. “That was the first time in my life where I had an ‘oh, shit’ moment,” he says. “As in, ‘Oh, shit, I don’t think I am going to survive, and I’m not even the one racing.’” The heat was so intense that he felt like he could hardly breathe, let alone run 40 miles. But he persevered. “It was quite the indoctrination.”

That fall, he accompanied Karnazes on his Endurance 50 project—50 marathons in 50 days. “I was one of the only people who was there with

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him the entire time,” Koop says. He traveled with Karnazes from marathon to marathon, monitoring his nutrition and taking daily blood and urine samples to track muscle fatigue and dehydration.

“Seeing what Dean accomplished was an inspiration for me,” Koop says. He ran his first ultra, the San Juan Solstice 50-miler in southwestern Colorado, the following year.

A year later, in 2008, Koop ran the Leadville Trail 100, and in 2010 both Western States and Hardrock. He has since run many of the major trail ultras in the West, including Badwater, the Bear 100, the Zion 100 and the Wasatch 100.

AS IN HIS PERSONAL RUNNING CAREER, Koop’s evolution into a well-known trail-and-ultra coach happened gradually. Soon after starting work with Karnazes in 2006, Koop began asking high-level ultrarunners to join CTS’s Sponsored Athletes program, which





Koop on the Intemann Trail in Colorado Springs, one of his favorite local runs.

offers elites free or discounted coaching. “Most of them were really young, and it was clear that they had no idea what they were doing,” Koop says of those ultrarunners. “I just wanted to help them out in any way I could.” At the time, few ultrarunners used coaches, and Koop’s advances were often met with laughter.

That anti-coaching sentiment has changed. In 2012, Koop asked Dakota Jones to join CTS as a sponsored athlete. The previous year, the 21-year-old had put himself on the map with a second-place finish at Hardrock. Jones signed on with Koop, and within a few months won the Lake Sonoma 50. “That opened people’s eyes, as Dakota is looked up to and well liked,” says Koop.

Today, roughly half of the athletes on Koop’s roster are trail ultrarunners. Almost all, he says, came his way through word of mouth.

ANY COACH will tell you that periodization—dividing up one’s training into different phases, each with a different focus—is necessary for an athlete’s development. But coaches organize that periodization in different ways.

Typically, a training plan moves from developing general aerobic fitness, early in the season, to greater specificity—hard workouts that more closely mimic racing—as the season progresses. Such a plan may rotate through different types of specific workouts—alternating between lactate-threshold and VO_2 max workouts, for instance—during the same phase.

By contrast, the approach used by Koop and CTS isolates one energy system at a time and works it intensively. This philosophy is based on Chris Carmichael’s experience coaching Armstrong and other members of the national cycling team. Elite athletes, says Koop, have years of endurance training under their belts, and additional fitness gains will be increasingly marginal. In order to squeeze further development out of an already seasoned athlete, he says, “You can either increase the total training load, or concentrate the load in one area at a time.”

Koop explains that, with this approach, the overall training load stays the same, but the gains are much higher. “It’s the law of adaptation,” he says. “The more stress you put on one thing, the bigger, badder and more efficient it is going to become.”

When structuring a training cycle, Koop begins with the system that will be used the least during an athlete's goal race, and ends with the one that will be used the most. For 100-mile races, which are run mostly at endurance intensity, that means starting with the speed phase (VO₂ max) and finishing with lower-intensity work (high-end aerobic, or endurance).

David Roche, a coach and elite trail runner based in California, says that the success of Koop's methodology may depend on the level of the athlete. "His systems-based workout philosophy is an optimal way for an advanced athlete to chase marginal gains," he says. "But that strategy might not work for everyone due to increased risk of injury or breakdown."

Other coaches echo Roche's concerns about injury risk. "When you stress one system repeatedly, you are asking for trouble," says Ian Torrence, a coach for Arizona-based McMillan Running and a seasoned ultrarunner himself. "Koop's system is born out of a cycling background, but cyclists don't get injured the way that runners do. In the case of runners, variety facilitates recovery."

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coaches is based on the hard-easy principle"—stressing the body to produce an adaptation, then allowing ample time to recover, adds Ian Sharman, an Oregon-based ultra coach and athlete with a number of top finishes at competitive 100-milers. "Koop comes from more of a cycling background where you can do more hard days in a row. This approach might cause [ultrarunners] to burn out faster than they would otherwise."

In addition to increasing injury risk, says Sharman, a systems-based focus can have diminishing returns: "You want to work on all energy systems at some point, but if you keep doing the same thing again and again, you get less benefit from it."

"Whenever I hear the criticism that back-to-back hard days leads to an increase in injury risk, I chuckle," Koop says. "The practice of running back-to-back long runs is extremely common in ultrarunning. Back-to-back long runs carry a far greater injury risk than back-to-back hard days, and produce comparatively little additional adaptation." On average, he says, he prescribes his runners two or three hard workouts per week; back-



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to-back hard days are scheduled sparingly, and only for experienced runners.

Ultimately, says Torrence, diverging opinions are constructive: "The coaching aspect of ultrarunning is pretty new, and it is important to have all of these different coaches with different philosophies. We are not sure what works yet."

KOOP SAYS THAT every coaching decision he makes and training plan he implements is grounded in science and data. That insistence on objectivity can take unexpected forms. When he catches himself using an "I" statement during a coaching session, he cuts himself off. When taking an athlete through tactics for a race, he pulls from someone else's blog, even if Koop has himself run that race in the past.

Why? Because what works for Jason Koop might not work for Kaci Lickteig, and what works for Hardrock probably won't work for the Javelina Jundred. "In ultrarunning there are a myriad of variables that affect velocity," Koop says, then rattles off a list: sleep deprivation; digestive upset; thermoregulation; blood-volume shift; stress from changes in temperature and altitude; mechanical stress on the joints, ligaments and

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tendons; stress on the skin.

Since Koop began coaching in the early 2000s, ultrarunning has grown, and with it the number of dedicated ultra coaches. But the sport and its coaching practice remain relatively new.

"Ultrarunning has not been popular for as long as some other endurance sports, so there is no infrastructure, no training bible," Koop says. He adds that, because he got his start training cyclists and triathletes, he has already been schooled in the basic framework of endurance training—and, more importantly, has learned to aggregate data and communicate with athletes about it.

Newer coaches coming from an ultrarunning background, Koop says, lack that framework, and too often rely on their own personal experience. His advice to aspiring endurance coaches is: "Avoid your own bias. What worked for you, or the first athlete you coached, may not be the best way." That, and get an exercise-physiology degree.

Matt Hart, an elite ultrarunner and coach who does not have an exercise-physiology degree, agrees that the science is important but says formal training shouldn't be a prerequisite.

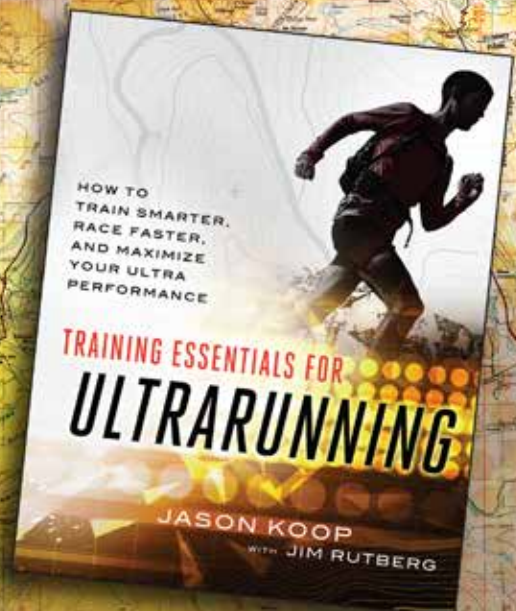
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“Every good runner we know wants to be a coach,” he says. “That alone doesn’t qualify them to be a good coach, but it is a great place to start, and it doesn’t mean they could never become a good coach. You just need to be curious, do your research and have a certain aptitude for the science. There has to be room for people who didn’t study genetics.”

Others minimize the role of exercise science altogether. Karl Meltzer bases his coaching on his extensive ultrarunning experience—he’s won 36 100-milers, more than any other runner. “If someone asked me to coach them for a 10K, I might steer them to a road-running coach, or a shorter-distance specialist,” he says.

Meltzer teaches his athletes to run by feel, and emphasizes mental training: “Science explains what is happening and why it is happening”—like an upset stomach or muscle cramps—“but it ultimately boils down to how well you know your own body and how you are able to push through those tough times in a race.”

But, Koop explains, an insistence on hard numbers does not mean a mechanical approach. “The most important part of my coaching philosophy does not have to do with physiology or what other people would consider coaching,” he says. “The most important thing is to care about the athlete as a person first. All the data comes second.”

Koop calls each of his athletes at least once a week. If

one has started a new job, or a new semester at school, he asks how it is going. They all have his personal cell-phone number, and text him on a regular basis.

“Working with Koop is a collaborative effort,” says Varner, the Sonoma 50-mile winner, who started with CTS in September 2014. “He listens to my goals, and then tailors his plan to get me there.” Koop even knows him well enough to anticipate and prevent fatigue, Varner says: “He has an uncanny ability to push you to your breaking point without actually breaking anything, which is great because most of us would just run ourselves into the ground otherwise.”

LAST AUGUST, Missy Gosney ran Nolan’s 14, an extremely difficult mountain run in Colorado. There is no official event—no aid stations, no set course—simply a standing challenge to link 14 14,000-foot peaks in Colorado’s Sawatch Range in under 60 hours. (See “The Nolan’s Project,” Issue 103, April 2015.)

Gosney had been working with Koop since 2013, the same year she started thinking about Nolan’s. She had been running ultras for only a few years, but had spent the last 15 teaching mountaineering for the Colorado Outward Bound School. The Sawatch were her home mountains, and she decided to make Nolan’s her goal. She started doing reconnaissance almost immediately.

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“The Nolan’s line is on the edge of Missy’s capabilities, and she was aware of that,” says Koop. “That had been her operating philosophy for three years. She couldn’t just go out and do it. This was like her Olympics.”

Koop joined Gosney on the trail in 2014, as she made her first Nolan’s attempt and summited 12 of the 14 peaks. “I always try to put my athletes in the best position to succeed,” says Koop. “This means the right coaching, the right training and the right support. I felt that by doing Nolan’s with her, I gave her a better shot at completing the line.”

The following year, Gosney teamed up with Anna Frost, a top mountain runner from New Zealand, to give Nolan’s another go. Koop had not planned to be there for the attempt, but last-minute business brought him to the area. He swung by, at first intending to just send Gosney and Frost off. But when the two women next met up with their crew, three peaks in, there was Koop grabbing Gosney’s water bottle for a refill. And again the next time, and the time after that. “He couldn’t pull himself away,” Gosney recalls. “He knew how hard I had worked for this and he wanted to be there.”

Twenty-four hours into the run, Gosney and Frost met their crew at the North Cottonwood Trail

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after battling through a night of storms on 14,078-foot Mount Columbia. Their moods had shifted south. It was too hard. They were too tired. They would never be able to finish. But Koop pushed them to go on.

“We came into Cottonwood bitching and moaning, and Koop just grabbed my backpack and started loading it,” Gosney recalls. “I was ready to quit but he wasn’t interested in hearing me complain.”

At a celebratory dinner after Gosney and Frost completed their run, Koop presented them with two four-foot-high plaques engraved with the Nolan’s route, complete with peak names and elevations and the pair’s approximate summit times. He had commissioned the plaques from a woodshop in Leadville, in between stopping to crew for the two runners.

“That’s what it’s about,” he says. “Being there at the culmination of everything to say, ‘Hey, I care.’”

ARIELLA GINTZLER is a freelance writer based in Carbondale, Colorado.

