

### Is There a Magic Formula?

One of the continuing themes discussed among sports physiologists, over at least the last 30 years, has been how different permutations of training intensity fit into the scheme of preparing athletes for competition. We seem to have a sense that there is some sort of “best way” to train—some way to get what Americans call “the most bang for the buck.” The origins of this within the sports physiology community reach back into the late 1970s and early 1980s, to the work of Wildor Hollmann and Wilfried Kindermann, in Germany, and Bertil Sjödín and Jan Svedenhag, in Sweden. Their writings suggested that one of the markers of either lactate or respiratory metabolism, which were becoming easier and easier to measure, might (in addition to teaching us something about exercise metabolism) hold important clues for defining optimal training intensities. This theme has played out with a very large volume of literature over the ensuing generation. The concept of a power output or velocity that could be sustained somewhat indefinitely—*critical power*—has also been around for a very long time, although Monod and Scherrer in 1965 were perhaps to first to use the specific term. Implicit in all these markers of exercise intensity is the idea that racing and training performance can be defined in terms of apparently unique physiologic thresholds, which we have evermore found ways to define.

The wide interest in examining how athletes train and how we monitor the training is a natural outgrowth of our quest to understand if there is indeed a “best” way to train. As published in *IJSP*, recent reviews (Seiler, Sept. 2010; Hofmann and Pokan, Dec. 2010) and commentaries (Lambert and Borresen, Sept. 2010) attest to the continuing interest in this topic to many—including the editor of *IJSP*. But, given that contemporary athletes are in many cases already training 20 or more hours per week, and that we may be approaching the species limit for muscular power output, the idea of optimizing training is not an idea that will go away anytime in the foreseeable future. Short of talent identification, tactical issues during competition, and nutritional/recovery issues, optimizing training is one of the central jobs for sports physiologists.

In this issue of *IJSP*, this theme continues with an excellent brief review, titled “Blood Lactate Diagnostics in Exercise Testing and Training,” by Ralph Beneke, Renate Leithäuser, and Oliver Ochentel, and an equally excellent commentary by Anni Vanhatalo, Andrew M. Jones, and Mark Burnley, titled the “Application of Critical Power in Sport.” Although currently working in the United Kingdom, Beneke is part of the “Cologne tradition” founded by Hollmann. I have known Ralph for many years and have always been impressed with his ability to visualize the “forest” amid the thousands of “trees” associated with exercise diagnostics using lactate. Vanhatalo, Jones, and Burnley, all from the U.K., were participants in what I think is the best ACSM symposium I have ever attended, in Seattle during 2009, on critical power. Coming from the lactate/respiratory camp myself, attending that symposium was the first time I ever understood critical power and how it could be used in a practical way to guide training and competition. I hope you all enjoy their papers in this issue.

Carl Foster, Editor