

Interview with Luke Bucci, Part IV -- Proteolytic Enzymes

G. Douglas Andersen, DC, DACBSP, CCN

Dr. Andersen: Dr. Bucci, in your book *Nutrition Applied to Injury Rehabilitation and Sports Medicine*, you mentioned that bromelain did not have to be enterically coated to be absorbed and demonstrate anti-inflammatory activity.

Dr. Bucci: I think it should be enteric coated for the best anti-inflammatory effects, but if you have quick stomach emptying, then it'll still get out of the stomach acid situation and be absorbed. That's why an empty stomach is more important than enteric coating.

Dr. Andersen: That really surprises me. When I did extensive research on proteolytics a few years ago, I found that they had to be enterically coated to have anti-inflammatory activity.

Dr. Bucci: Well, for bromelain it's not necessarily the case.

Dr. Andersen: Is there a safe, easy, inexpensive way for the chiropractor to determine if the patient they are treating has quick stomach emptying and does not require an enterically coated product?

Dr. Bucci: No, I would stick with the enterically coated product. I recommend that in the book because you're better to be safe than sorry.

Dr. Andersen: One of the most confusing and frustrating aspects of recommending proteolytic enzymes is units of measurement. When I wrote my series on proteolytic enzymes a few years ago, some of the units of measurement I came across included caseolytic units, Armour units, Rohrer units, national formulary units, gelatin-dissolving units, milk-clotting units, and the United States pharmacopeia units. To make matters worse, although trypsin, chymotrypsin and papain did have USP ratings, one cannot compare them. To rate each enzyme a different substrate is used. There is no common denominator or conversion factor. I know of no rational way one can recommend any sort of dose other than to instruct a doctor or a patient to take a handful of pills two to four times a day on an empty stomach and hope for results.

Dr. Bucci: Unfortunately you're correct. That's how proteases have been studied since they were discovered way back in the early part of the century. If you use an assay that shows that, for example, trypsin is red hot, bromelain doesn't test well, and vice versa. If you use milk-clotting units, chymotrypsin does not show a lot of activity. You have all these different assays and then you find enzyme-specific substrates. So, it is a huge morass. It's just an absolute disaster. I think this more than anything has allowed proteases to not be given their due concern. It was a big problem when they were prescription items. That's where you get Armour units, from the Armour hot dog people and their Chymoral product. And Rohrer units with their bromelain product, and several others like that.

Dr. Andersen: I think chiropractors would use a lot more enzymes if the nutrition companies that serve our industry could pool their resources and come up with common denominators that doctors could use for dosing and product comparison. The only common denominator out there now seems

to be weight, and the weight of an enzyme means nothing. The activity is what is important, and comparing activities between enzymes and companies is just about impossible.

Dr. Bucci: That's correct. You're absolutely right. Some people use weights and that gives you an idea of how much of the pure stuff is there, you hope. Again, there are different grades of pancreatin, of trypsin, and especially bromelain and papain. There is almost pure and then there's five percent. And you really don't know if somebody has put in 100 mg of the five percent stuff or 100 mg of the 90 percent stuff. They can say it on the label, but even if they do it may not be active because it sat around too long before the company got hold of it or before it was bottled. I've assayed products and found no activity. After talking to one company about it, saying you really need to look at this, they sent me, in addition to their lawyer's name and number, a certificate of analysis of that batch showing that it has all this enzyme activity. I used up-to-date, enzyme-specific methods to show there was no more activity in the product. Somebody is being fooled, and it isn't me.

Dr. Andersen: The really frustrating thing about proteolytic enzymes is that when you have an active product that is dosed correctly, proteolytic enzymes can have a powerful anti-inflammatory effect without any of the gastrointestinal side effects of nonsteroidal anti-inflammatories.

Dr. Bucci: Yes. Since these things used to be pharmaceutical, you can't go wrong if you take the pharmaceuticals.

Dr. Andersen: I don't know of any companies that sell pharmaceutical enzymes.

Dr. Bucci: There are a few out there, but they are prescription items, like Chymoral, so I think that takes most DCs out of the loop. I don't even think they're sold much anymore. I've had a hard time finding them in pharmacies. Every once in a while I'll walk into a pharmacy and ask, "Do you have Chymoral?" They go, "Huh? Oh, yeah, that was 20 years ago or something." So even the pharmaceutical companies have replaced them with NSAIDS.

Dr. Andersen: Maybe as the literature continues to pile up on the negative effects of nonsteroidal anti-inflammatories, the pharmaceutical industry will take a second look at proteolytic enzymes. I would have no problem with sending my patients down the street to the general practitioner to get a prescription for a good pharmaceutical grade proteolytic enzyme that would reduce inflammation without comprising the integrity of the gastrointestinal tract.

Dr. Bucci: If that's the only way to do it, I'm all for it. There are good products out there right now. Even if you find a good company, they may have batch-to-batch variations over different years or different months. You really have to find one that works and stick with it.

Dr. Andersen: Unfortunately, I wish there was some way other than doing a trial and error on your own patients. I get calls from doctors all the time asking me for dosing advice on proteolytic enzymes. It's impossible to give any specific recommendations for, say, a grade II sprain over the phone when every product on the market uses a different unit of measurement. Imagine if everyone who sold vitamin C had a different unit of measurement for it and there was no common denominator or way to compare products. It would be a mess and utilization would plummet.

Dr. Bucci: Don't feel bad because the food industry has the same problem, and they deal with tons of these enzymes every year, which is really interesting. They have had the same trouble trying to figure out who has what. They have big bucks and careers riding on single batches of fermented products. If they don't use the right amount, the monetary losses can be staggering. It's not just us, it's everyone who gives or uses proteases. I think there has to be something done with the

manufacturers of these enzymes. I feel they need to stick with just a few assays, and run all the assays on every product. That way you have a clear picture of the spectrum of activity and the activity itself. But, at least for the near future, I don't see it happening.

Dr. Andersen: Dr. Bucci, although it is not a proteolytic enzyme, before we conclude I would like to ask you about superoxide dismutase (SOD). Does it have oral activity? Many of the doctors and scientists in this industry I respect have stated it is not absorbed orally, and yet there are those who continue to insist otherwise. What is your opinion?

Dr. Bucci: All I can say about SOD is that it gets in your mouth but not in your hands. It does not get absorbed. I spent six years looking for oral SOD absorption, and never found it.

Dr. Andersen: This coming from you is impressive considering the company you used to work for.

Dr. Bucci: Well, yes, and that's why you won't see that data, because obviously it was not what we all wanted to see. You can't boost intracellular SOD levels, because if you have too much SOD you end up with Down's syndrome, basically. One of the primary lesions in Down's syndrome is too much SOD and not enough of the other antioxidant enzymes to counteract it.

Dr. Andersen: Dr. Bucci, thank you very much for your time.

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SEPTEMBER 1995