UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C. 20436

Before The Honorable Theodore R. Essex

Administrative Law Judge

In the Matter of CERTAIN OMEGA-3 EXTRACTS FROM MARINE OR AQUATIC BIOMASS AND PRODUCTS CONTAINING THE SAME	Investigation No. 337-TA-877

REBUTTAL WITNESS STATEMENT OF DR. JACEK JACZYNSKI

158.   Q: What is the significance, if any, of Mr. Haugsgjerd's added steps of flushing oil fractions with nitrogen gas and freezing them at -20°C before heating?

A: These steps would have suppressed the heat-induced hydrolysis that would occur during heating of the samples to 125°C, as required by Beaudoin I, or to 60-70°C, as required by Beaudoin II, which was performed later by Dr. Gundersen.

160. **Q: Did Dr. Gundersen properly heat the samples according to the Beaudoin process?**

A: No, Dr. Gundersen heated the samples using a technique inconsistent with Beaudoin I and II. Specifically, Gundersen placed a heat block inside the oven of a gas chromatograph set to either 70°C or 125°C for at least one hour. He then used the heat block to heat vials of krill oil extract for 15 minutes at 125°C or 5 minutes at 70°C. After Gundersen heated the vials, they were allowed to cool to room temperature before analysis.

161. **Q: What is the significance, if any, of Gundersen's use of a heat block?**

A: Gundersen's heating method was mediated primarily by air-liquid convection and not conduction. This treatment would not allow the oil to be heated the temperatures disclosed in Beaudoin I or II, or for the amount of time specified in Beaudoin I or II, due to the slow heat transfer to the oil from the heat block.

162. **Q: Is the distinction between convection and conduction heating accepted in the field?**

A: Yes, it is a basic and well-established fact that conduction results in much quicker heat transfer than convection.

163. **Q: Why is that?**

A: In simple terms, heated air contains relatively fewer molecules that can transfer heat from one object to another, as compared to heated liquids, such as oils as in a heated oil bath. As a result, the transfer of heat by convection is much slower than conduction.

164. **Q: Could you further explain this distinction by using an analogy?**

A: Yes, I frequently use analogies in teaching my students. To visualize convection heating, as used by Gundersen, consider putting your hand in a heated kitchen oven set to say, 400°F, which is about 200°C. Contrast this with putting

your hand in pot of boiling water (which is around 100°C), which would be akin to conduction heating. Even though the oven is set to a much higher temperature, putting your hand in the oven wouldn't cause discomfort or injury immediately, but putting your hand in the boiling water would cause an immediate and painful burning sensation.

165. **Q: Would Gundersen's use of a convection heating as opposed to conduction heating have affected the composition of the post-heated extracts?**

A: Yes. Gundersen's heating was essentially ineffective and milder than the heating step taught in Beaudoin I and II because the heat block would not have maintained the temperature of 125°C for 15 minutes or 70°C for 5 minutes. Therefore, there would have been significantly less hydrolysis of the ester bonds than there would have been if Gundersen had heated using a water or oil bath, as has been done in other recreations commissioned by Aker such as those done by Dr. Budge.

166. **Q: Have you seen any evidence to support your conclusion that Gundersen's use of the heat block would have been ineffective?**

A: Yes. The HPLC-MS data presented in Appendix A to the Gundersen Declaration, RX-0089, appears to detect the same intensity peaks for non-heated, heated to 60°C or 70°C, and heated to 125°C. This is shown by looking at the chromatograms labeled P308-1, P308-2, and P308-3. One would expect to see differences in the intensity of the peaks, for example, depending on whether it was unheated or heated to 125°C. This further underscores the ineffective heating approach used by Gundersen.

199. **Q: You mentioned adding steps to Beaudoin. How did Dr. Budge's sample creation deviate from Beaudoin I and II in this regard?**

A: Beaudoin discloses substantial moisture content in his krill oil. But Dr. Budge's extraction process involved substantial additional water removal steps that were not performed in Beaudoin I or II. In particular, Dr. Budge explains at RX-0602.0013 that she heated the samples to 38°C during reduced-pressure evaporation and further explains at RX-0602.0014 that she used a separatory funnel and centrifuge. None of these water-removal methods was disclosed in Beaudoin I or II, and each method would independently result in a lower water concentration than would be present in a sample prepared according to Beaudoin I and II. This is an obvious change to the composition of the resulting samples, and it would necessarily affect the amount of hydrolysis and skew the results for at least some of the tests Respondents ran on the Budge Samples.

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