1116-Q5-1988 **Aditya P Adiredja*** (adiredja@math.arizona.edu), ENR2 Rm S317, 1064 E. Lowell St., Tucson, AZ 85719. *Using the Pancake Story to Make Sense of the Epsilon Delta Definition.*

The well-documented students' difficulty with the formal definition of a limit has instigated debates about its introduction in first semester calculus. This study explores the utility of an instructional analogy, the Pancake Story in assisting students to make sense of the temporal order of ϵ and δ in the definition: the stipulation that for any given $\epsilon > 0$ there exists a $\delta > 0$. The Pancake Story was designed to leverage the intuitive notion of quality control in learning the formal definition. Eighteen first and second year university students participated in a semi-structured interview about the definition. Students responded to questions about the temporal order before and after discussing the story. The results show a large shift in the number of students who responded with "epsilon first." This pattern was not found with the comparison group who read about the temporal order in a textbook. The analysis also compared common justifications for the temporal order before and after engaging with the story. The study argues that the notion of quality control serves as an accessible entry into understanding the formal definition. The findings also show that formal mathematics can be productively built upon students' intuitive knowledge. (Received September 21, 2015)