



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Shilpa P. Argade</b>	<b>Project Number</b> <b>J0401</b>
<b>Project Title</b> <b>Which Milk Is the Best for Your Baby?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> This project was done to determine the contents of Sialic Acid present in human milk and infant milk formulas. Sialic Acid is an important sugar for the development of a baby's brain, immunity against infections, and development of their digestive system. It is known that there is a high amount of Sialic Acid in human milk, but many babies are fed infant milk formulas instead of their mother's milk. This project is a comparison study of the total Sialic Acid contents present in infant milk formulas vs. human milk at the various stages of lactation.</p> <p><b>Methods/Materials</b> For this project, six cow's milk based infant milk formulas and five human milk samples were analyzed for their total sialic acid contents. The experimental procedure consisted of the release of sialic acid using a mild acid hydrolysis. The released sialic acid was then derivatized using DMB to obtain a fluorescent tag on the Sialic Acid. Then, the tagged Sialic Acid was analyzed and quantified using the HPLC system with the fluorescence detector.</p> <p><b>Results</b> Results indicated that the total Sialic Acid detected in human milk was at least 3 times higher than that in the infant milk formulas. Out of the infant formulas, Nestle Good Start had the most Sialic Acid, while Isomil, a soy-based formula had none. Out of the human milk samples, Colostrum (milk at day 4) had the highest amount of Sialic Acid and the amount decreased with the stages of lactation over a 12-week period.</p> <p><b>Conclusions/Discussion</b> My results show that human milk is the best source of nutrition for an infant especially in the early days of infancy and also for pre-term babies since it has a significantly higher amount of Sialic Acid. This study is important because it helps people understand the importance of sialic acid and helps them make a right choice in selecting the most nutritious milk for an infant, especially because this information is relatively new and is not on the milk cans of the infant formulas that are available in the supermarket.</p>	
<b>Summary Statement</b> This project is a comparative study of the total Sialic Acid contents in infant milk formulas vs. human milk at the various stages of lactation.	
<b>Help Received</b> Mother helped guide me in the lab; Father helped me with graphs; Teacher gave me suggestions; Used lab equipment at UCSD under the supervision of Dr. Sulabha Argade.	