



# CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

<b>Name(s)</b> <b>Katelyn R. Paxton</b>	<b>Project Number</b> <b>S1818</b>
<b>Project Title</b> <b>Soy: Carcinogen or Prevention?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> This project is to determine if isoflavone phytoestrogens found in either hormone replacement therapy or infant nutritional formula may cause a change in the luteinizing hormone level that regulates estrogen production, and how the trials for both suggest pre-breast cancerous carcinogenic effects. The hypothesis is that phytoestrogens will stimulate the overproduction of the hormone estrogen through a rapid surge in the LH level, and will exhibit similar effects in both experiments.</p> <p><b>Methods/Materials</b> Four female mice, given either HRT or daily infant nutritional formula, and four separate female mice, not exposed to soy products of any kind, were tested over a ten-day trial period. Each mouse had its own individual cage with half paper shreds, and half wax paper. All subjects received the same amount of food each day at the same time over the trial period. All received 2 fl. oz. of distilled water a day, and manipulated subjects were also given either crushed HRT tablets or infant nutritional formula dissolved in their water. Doses of HRT and infant nutritional formula were proportioned to the mice's weight and size. Every night, urine samples were taken and distributed on an ovulation test that gave the exact luteinizing hormone level. Mice were also monitored to look for unusual behavioral patterns.</p> <p><b>Results</b> After the first 72 hours, the controlled group's LH level remained steady at a rate of 7.0 mIU/ml, while the HRT manipulated group rose from an average of 7.3 mIU/ml to 11.4 mIU/ml; and the INF group rose 7.2 mIU/ml to 9.0 mIU/ml. At the conclusion, the controlled group's level was still constant at 7.4 mIU/ml, while the HRT manipulated group's had surged to 23.6 mIU/ml; the INF group concluded at 17.0 mIU/ml. The manipulated group also experienced similar negative physical effects, such as loss of appetite and fatigue.</p> <p><b>Conclusions/Discussion</b> The hypothesis was supported by the data collected. Over the ten-day trial period, the HRT manipulated group's hormone level surged about 16 mIU/ml; while the INF group's surged 9.9 mIU/ml and grew at a constant rate to levels considered abnormally high. The effects, such as fatigue, shaking, restlessness, and loss of appetite, suggest that if these LH rates continued for a substantial period of time, breast cancer has a potential to develop. Research suggests that high levels of estrogen for a long period of time can cause rapid cell mutations and proliferation.</p>	
<b>Summary Statement</b> Testing and comparing the potentially carcinogenic effects of two soy isoflavone phytoestrogen products, hormone replacement therapy and infant nutritional formula.	
<b>Help Received</b>	