

# SALIVA DIAGNOSTICS FOR KIDNEY DISEASE

Linden Heflin & Sarah Walsh

Spring 2007

## ABSTRACT

This project evaluates the development of a saliva-based diagnostic tool analyzing kidney functioning by measuring the concentration of creatinine, a biomarker related to blood filtration. An economic analysis reveals a high expected demand and profitability for this product in comparison to existing blood tests that are currently being used in the medical community.

The test utilizes a reaction between creatinine and picric acid which results in a color change that can be used to determine the concentration of creatinine and therefore the level of kidney functioning. Some compounds, however, are known to interfere with this reaction, creating misleading results. Various product designs were developed in response to this issue, such as adding certain components to the test to reduce or monitor the affects of the interfering compounds.

A consumer satisfaction model was created to determine consumer preference with regard to discomfort level, early diagnosis efficacy, and the likelihood of false results due to interfering compounds. A price and demand model, including consumer preference, as well as consumer knowledge and competition, found that the highest demand was for a product designed to reduce negatively interfering compounds while monitoring the level of positively interfering compounds. However the product cost associated with that design option was significantly higher than others. A net present worth calculation was used to determine the most profitable product design which estimated an NPW of \$10 million for a design priced at \$4/test which reduces negative interference, but does not monitor levels of positively interfering compounds.