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1699-50200, Bungoma, Kenya. *Mathematical Model for Nutrient Exchange Across the Placenta.*

This study presents a new mathematical model for nutrient exchange across the placenta which include nutrient exchange from foetus to mother to provide a system of equations in the form, $\dot{\mathbf{Y}} = A\mathbf{Y} + \vec{r}(t)$ and whose solution was analyzed for equilibrium and stability. This model introduces another parameter that takes care of waste elimination from foetus to mother. It was established that the final model is stable compared to the existing models, that is, the eigenvalues of the coefficient matrix are negative real number and complex numbers with negative real parts. This shows that the new model provides one straight line of solutions tending to the origin and a plane of solutions which spiral towards the origin. This gives a more accurate mathematical model for nutrient exchange in the placenta. This model would create a lot of insight into nutrient exchange in the placenta, the elimination of waste from the foetus and open room for further research from the mathematical concept developed.

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