CHAPTER 5

SUMMARY AND CONCLUSION
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The thesis consists of five chapters. In chapter 1, functions, absorption and metabolism of vitamin A and carotenoids, assessment of vitamin A status, bioavailability of carotenoids in brief were covered.

Chapter 2 is divided into Chapter 2A, Chapter 2B and Chapter 2C.

In chapter 2A retinol concentration in pregnant women in the third trimester of selected women residing in Guwahati is determined. Results of this Chapter reveal that about 41% of the studied women had serum retinol less than 20µg/dl. Factors like age, parity and type of diet was found to have no effect on the serum retinol concentration of the selected women.

Chapter 2B presents the results of cord serum retinol concentration collected from the placental end of the cord from 63 women. The results of Chapter 2B show a significant positive correlation between the maternal serum retinol and birth weight as well as between maternal serum retinol and cord blood retinol which demonstrates the possible role of maternal vitamin A in influencing the birth weight as well as the cord blood retinol. A statistical positive correlation was also observed between cord blood retinol and birth weight only in Low Birth Weight neonates.

Retinol and carotenoid concentrations were estimated in both colostrum and matured milk in chapter 2C. Mean retinol and carotenoid concentration (Lutein, β-Carotene and Lycopene) are found to be less in matured milk compared to colostrum. Mean retinol concentration both in colostrum and matured milk are found to be in conformity with similar type of studies conducted elsewhere. Out of the
carotenoids identified (Lutein, β-Carotene and Lycopene), Lutein both in colostrum and matured milk of our study is found to be the predominant form of carotenoid. The mean β-carotene and lycopene concentration of milk is found to be low. The results of this study also reveals that significant positive correlations exist between serum retinol concentration during pregnancy and colostrum retinol as well as between serum retinol concentration during pregnancy and matured milk retinol which indicates that serum retinol during pregnancy influences the concentration of retinol in milk. The retinol concentration in milk will affect the retinol concentration of breast fed infants. Therefore, it becomes very important to monitor the vitamin A status during pregnancy and should try to improve the status of vitamin A either through supplementation or diet so that an adequate concentration of retinol in milk is achieved.

In chapter 3 we have estimated retinol and carotenoids (Lutein, Lycopene and β-Carotene) in the serum of 24 children of less than 2 years old. The findings of this chapter pointed that there is a risk of vitamin A and carotenoid deficiency in children below 2 years old especially in children above six months of age i.e. at the time of weaning mother’s milk. The present investigation clearly indicates that breast milk provides protection against VAD in exclusive breastfed infants. Lutein which has no pro-vitamin A activity but is an effective antioxidant was found to be the most predominant form of carotenoid in the studied children of this area. The results of this study also reveals that β-carotene concentration is significantly lower in children with vitamin A deficiency (serum retinol<20µg/dl). In our study, it also reveals that there is no statistical difference between the mean concentration of retinol and identified carotenoids between boys and girls.
In chapter 4, lutein and β-carotene concentration in lipoprotein fractions of serum of adult volunteers was determined to have an idea about the distribution of the carotenes and xanthophylls. Fasting serum samples were collected from 16 numbers of adults with no sign of hypertension, diabetes, cardiovascular disease and lutein as well as β-carotene not only in lipoprotein fractions but also in serum was estimated. In the present study, the mean lutein and β-carotene concentration in serum was found to be 15.91µg/dl and 5.62µg/dl respectively. The percentage of β-carotene of our study group ranged from 77% to 85% in LDL+VLDL fractions and 15% to 23% in HDL fractions. On the other hand, the percentage of lutein of our study group ranged from 52% to 61% in HDL fractions and 39% to 48% in LDL+VLDL fractions. Here, we found a statistically significant positive correlation between serum lutein and cholesterol, serum lutein and HDL, serum lutein and LDL as well as between serum β-carotene and HDL. The positive correlation between serum β-carotene and LDL as well as between serum β-carotene and cholesterol is found to be statistically not significant. A negative correlation between serum lutein and VLDL, serum lutein and triglycerides, serum β-carotene and VLDL as well as between serum β-carotene and triglycerides was found but are not statistically significant.

Very low β-carotene concentration in breast milk as well as in the serum of children of less than 2 years old and in adults is reported in this study. This may be explained like that whatever the amount of beta-carotene absorbed gets immediately converted to vitamin A due to low vitamin A status of the population. Lycopene concentration was also found to be less in milk as well as in the serum of children.
below 2 years old. Future research regarding the factors that affect the bioavailability of carotenoids found in local plant foods may also be carried out.

Dr Bandana Bhuyan, Regional director of NIPCCD (National Institute of Public Cooperation and Child Development) (The Assam Tribune, 2013) reported that even today there exits a number of myths in food habits of pregnant women and nursing mothers. She further added that not just in rural areas but even in developed corners of this region, people tend to follow the trail of their own inherited style of food intakes. Although not all of them are harmful but some are found to be detrimental to the health of both mother and the child which is really an area of concern. This implies that most of the inherited foods may not be a good source of specific carotenoids which may lead to deficiency of these nutrients. Low carotenoid concentration particularly β-carotene and lycopene in breast milk as well as in children less than 2 years old reported in this study may also be because of consumption of specific kind of inherited foods.