SUMMARY AND CONCLUSION
Profile of Mid Day Meal School Children

- In the present study there were total 46% of boys and 54% of girls. Maximum (22.50%) school boys were of 12 years old and maximum (19.75%) school girls were of 10 years old.

- The Muslim school children (64.50% boys and 52.46% girls) were higher in number in comparison to Hindu school children (35.50% boys and 47.54% girls).

- The maximum number of school boys and girls were in class III and class II, respectively and the least numbers of boys and girls were in class V.

- The maximum numbers of school boys and girls were having 5 to 9 family members.

- The maximum number of school aged boys and girls were having monthly family income of Rs.3000 to Rs.6000 and the least numbers of school aged boys were having monthly family income of above Rs.9000 and in girls it was of Rs.6000 to Rs.9000.

- The maximum number of school aged boys (55.07%) and girls (54.34%) were having only one earning member in their family and the least number of boys and girls were having four and above earning members in their family.

- The maximum number of school aged boys (41.30%) and girls (49.38%) were having illiterate fathers and 72.46% boys and
77.16% girls were having illiterate mothers. Only 1.45% boys and 2.46% girls were having inter passed father. None of the boy as well as girl was found to have inter or graduate mother.

- The maximum numbers of boys (86.96%) and girls (84.57%) were having homemaker mother.
- The maximum number of school aged boys (83.33%) and girls (74.70%) were having nuclear family.
- 49.27% boys and 49.88% girls of MDM schools were having low standard of living where as 12.33% boys and 12.97% girls were having high standard of living.
- More than fifty percent i.e. 55.81% boys were having poor personal hygiene as compared to girls (48.15%). Good personal hygiene was found 8.69 % in boys and 6.79% in girls.

Profile of Non-Mid Day Meal School Children

- There were total 45% boys and 55% girls in NMDM school. Maximum 21.48% of school aged boys were of 11 years old and 31.51% of girls were of 12 years old.
- The Muslim school aged children including boys and girls were higher in number (73.67%) in comparison to Hindu children (26.34%).
- The maximum number of school aged boys and girls were found in class II and the least number of school aged boys and girls were found in class V.
- The maximum number of boys (71.12%) and maximum number of girls (83.64%) were having 5 to 9 family members.
• The maximum number of school aged boys and girls were having monthly family income of Rs.3000 to Rs.6000 and the least number of school aged boys and girls were having monthly family income of above Rs.9000.

• The maximum number (59.24%) of school aged boys and 58.80% girls were having one earning member in their family and the least number (1.48%) of school aged boys and 0.06% girls were having four and above earning members in their family.

• The maximum number of school aged boys (45.92%) and girls (43.63%) were having illiterate father and 77.26% and 76.97% illiterate mother, respectively, where as minimum number of boys (2.22%) were having inter passed father and 2.96% primary passed mother. The minimum numbers of girls (1.24%) were having graduate qualified father and 2.44% high school passed mother. None of the boy and girl was having inter or graduate passed mother.

• The maximum number 85.19%o and 89.70% of NMDM school aged boys and girls, respectively were having homemaker mother.

• The maximum number of NMDM school aged boys i.e. 77.78% and girls 73.94% were having nuclear family.

• 45.18% of NMDM boys were having medium standard of living where as 49.70% of NMDM girls were having low standard of living. Minimum 12.60% and 12.12% of NMDM boys and girls, respectively were having high standard of living.
Summary and Conclusion

- A similar number (37.77%) of NMDM boys were having fair and
classic hygiene where as maximum 52.72% NMDM girls
were having fair personal hygiene.

Height and Weight of MDM and NMDM School Children

- The height of MDM boys and girls in the age group 6 to 14 years
ranged from 113.5 cm to 155.65 cm and 116.31 cm to 152.05 cm,
respectively. The total increment in boys was 42.15 cm and in girls
was 35.74 cm.

- The height of NMDM boys in the age group 8 to 14 years ranged
from 126.88 cm to 155.79 cm, a total gain of 28.91 cm in boys and
the total increment in girls was 27.2 cm.

- The weight of MDM boys in age group 6 to 14 years ranged from
15 kg to 31.15 kg, a total gain of 16.15 kg. In girls of age group 6
to 14 years the weight ranged from 15.25 kg to 34.9 kg, a total
weight gain of 19.65 kg.

- The weight of NMDM boys ranges from 21.83 kg to 39.45 kg, a
total gain of 17.62 kg from age 8 to 14 years. In girls from age 8 to
14 years, the weight ranges from 22.39 kg to 39.43 kg with a total
gain of 17.04 kg.

- In the present study, both MDM and NMDM boys were found
shorter than CDC standard, but the difference in height were not
very large in NMDM boys as compared to the difference in height
of MDM boys to that of CDC standard.

- The results of this study indicate that the MDM girls and NMDM
girls were shorter than well to do girls of CDC standard at overall
ages but the MDM girls was much shorter when compared with CDC standard.

- The weight of MDM and NMDM boys was found to be lighter than CDC standard across all ages.

- The weight of MDM school girls was lighter than CDC well to do girl children, differing about 5.05 kg to 14.4 kg across the ages. NMDM girls were also lighter than CDC girls but the difference ranges from 0.8 kg to 11.15 kg which was lower the MDM girls.

**Nutritional Status of MDM and NMDM School Children**

- The maximum number 75.37% of MDM boys and 74.68% MDM girls were found stunted as compared to NMDM boys (54.08%) and NMDM girls (58.39%).

- The number of stunted girls was higher in both MDM and NMDM schools than the number of stunted boys.

- The maximum number of stunted boys (79.25%) in MDM school were in age group 9 to 11 years and the maximum number of stunted boys (66.64%) in NMDM school were in age group 6 to 8 years.

- The maximum number of stunted girls (80.03%) in MDM school were found in age of 12 to 14 years and the maximum number of stunted girls (59.56%) in NMDM school were also in age group 12 to 14 years.

- The maximum number i.e. 89.14% of MDM boys and 77.17 % of MDM girls were suffering from under nutrition (thinness) as compared to 79.26% NMDM boys and 76.37% of NMDM girls.
• The maximum number of thin boys (94.12%) in MDM school was of younger age (6 to 8 years) and the maximum number of thin boys (81.33%) in NMDM school were of age 12 to 14 years.

• The maximum number of thin girls (84.45%) in MDM school were of 12 to 14 years old and the maximum number of thin girls (77.78%) in NMDM school were of 9 to 11 years old.

• The maximum number of MDM children suffering from under nutrition was having monthly family income of Rs.3000 to Rs.6000 and the least number of under nourished children were in income group of Rs.6000 to Rs.9000.

• The maximum number (84.8%) of children of MDM school suffering from under nutrition were having homemaker mother.

• 86.87% children of MDM school were having nuclear family as compared to 67.19% children of joint family.

• The maximum number (49.33%) of MDM children were having low standard of living and least 12.64% were having high standard of living.

• The maximum number (51.68%) of MDM children was having poor personal hygiene and least 7.66% were having good personal hygiene.

• Monthly family income had a significant effect on the nutritional status of MDM school children.

• The nutritional status of MDM school children was greatly influenced by the working status of mother.
• Types of family i.e. nuclear family and joint family had a significant impact on the nutritional status of MDM school aged children.

• The nutritional status of MDM school children was significantly influenced by the standard of living.

• The personal hygiene of MDM school children had a significant impact on the nutritional status of school of children.

• The quality of mid day meal had a significant impact on the nutritional status of MDM school aged children (6 to 14 years).

• The quantity (energy and protein content) of mid day meal had an insignificant impact on the nutritional status of MDM school children.

• The eating of mid day meal had a significant relationship with the nutritional status of MDM school children.

• The nutritional status of MDM school children was influenced by the likeness of children toward mid day meal.

• The feeling of fullness after eating mid day meal had a significant impact on the nutritional status of MDM school children.

• The prevalence of nutritional deficiencies had a significant impact on the nutritional status of MDM school children.

Prevalence of Nutritional Deficiency in MDM and NMDM School Children

• The prevalence of anemia was found higher in MDM boys (56.36%) of age group 12 to 14 years where as the maximum number of anemic NMDM boys were of 9 to 11 years old (42.10%).
• The prevalence of anemia was higher (50%) in younger MDM girls of age 6 to 8 years; similarly, maximum (75%) anemic girls in NMDM school were of 6 to 8 years old.

• The prevalence of anemia was higher (47.67%) in MDM school children as compared to NMDM school children (34.34%).

• The prevalence of clinical signs of vitamin C deficiency was maximum (82.35%) in MDM boys of 6 to 8 years, similarly, in NMDM school younger boys of 6 to 8 years were found with maximum (66.64%) signs of vitamin C deficiency.

• The prevalence of vitamin C deficiency among MDM girls was higher (56.72%) in age group 9 to 11 years where as in NMDM school girls of 6 to 8 years were more affected by vitamin C deficiency.

• The prevalence of vitamin C deficiency was higher in MDM school children than those of NMDM school children.

• The prevalence of vitamin A deficiency in MDM and NMDM school boys was higher in age group 9 to 11 years (51.52% and 45.62%, respectively); however, the prevalence was higher in MDM boys as compared to NMDM boys.

• The prevalence of vitamin A deficiency in MDM and NMDM school girls was 48.89% and 40.23% in age group 12 to 14 years and 9 to 11 years, respectively.

• In both MDM and NMDM children, the prevalence of vitamin A deficiency was higher among boys than those of girls, where the percentage was higher in MDM children as compared to NMDM children in both sexes.
Summary and Conclusion

- The prevalence of vitamin B complex deficiency in MDM and NMDM school boys was higher (58.83% and 66.67%, respectively) in boys of age 6 to 8 years. Percentage of prevalence was higher in NMDM boys.

- The prevalence of vitamin B complex deficiency in MDM school girls was maximum (41.80 %) in age group 9 to 11 and in NMDM girls 75% in age group 6 to 8 years.

- The maximum number of MDM boys was found with vitamin B complex deficiency than those of NMDM boys. The prevalence was higher in MDM girls as compared NMDM girls.

- The maximum number of boys of age 12 to 14 years of both MDM and NMDM schools were having dental caries (52.73% and 40%, respectively) where the prevalence was higher in MDM boys than NMDM boys.

- The maximum number of MDM girls having dental caries was of 9 to 11 years old (35.83%) and the maximum number of NMDM girls having dental caries was of 12 to 14 years (39.33%).

- The maximum number of boys in MDM school was affected from dental caries than those of NMDM boys and the prevalence of dental caries was lower in MDM girls as compared to NMDM girls.

Academic Achievement of Mid Day Meal School Children (2011)

- The maximum number of MDM children (13.97%) obtained grade A i.e. above 70% were of class II and least number of children (8.75%) obtained grade A were of class IV.
The maximum number of MDM children (34%) obtained grade B i.e. between 55 to 69% was of class V and least number of children (16.25%) obtained grade B was of class IV.

The maximum number of MDM children (51.25%) obtained grade C i.e. between 40 to 54% was of class IV and least number of children (29.87%) obtained grade C was of class III.

The maximum number of MDM children (22.50%) obtained grade D i.e. 30 to 39% was of class IV and least number of children (13.97%) obtained grade C were of class II.

Almost similar percentage of MDM children of all classes obtained grade E i.e. below 29%.

Academic Achievement of Non-Mid Day Meal School Children (2011)

The maximum number of children (55.88%) obtained grade A i.e. above 70% was of class V and least number of NMDM children (36.73%) obtained grade A was of class II.

The maximum number of children (42.85%) obtained grade B i.e. 55 to 69% in NMDM school was of class II and least number of children (22.05%) obtained grade B were of class V.

The maximum number of children (71.64%) obtained grade C i.e. 40 to 54% was of class V and least number of children (11.23%) obtained grade C was of class II.

The maximum number of children (11.12%) obtained grade D i.e. 30 to 39% was of class III and least number of children (2.93%) obtained grade D was of class V.
• None of the children of class III and class IV obtained grade E in their annual exams of 2011.

**Improvement in Academic Achievement of School Children from 2010-2011**

• The maximum number of MDM boys obtained grade C in their annual exams of 2010 as well as 2011 where as in NMDM boys majority of them obtained grade B in 2010 and grade A in 2011.

• The maximum number of MDM girls obtained grade C in their annual exams of 2010 and 2011. However in NMDM girls, majority of them obtained grade B in their annual exams of 2010 and 2011. Thus the academic achievement remained same for both school children in previous and preceding year.

• A significant difference was observed between the academic achievement of MDM school children and NMDM school children.

• The academic achievement of MDM school children was influenced by the monthly family income.

• The academic achievement of MDM school children was influenced by the working status of mother.

• Types of family i.e. nuclear family and joint family had an impact on the academic achievement of MDM school children.

• The quality of mid day meal had no impact on the academic achievement of MDM school children.

• The quantity (energy and protein content) of mid day meal had a significant impact on academic achievement of MDM school children.
• The eating of mid day meal had no significant impact on the academic achievement of MDM school children.

• Likeness of children toward mid day meal had no impact on the academic achievement of MDM school children.

• Feeling of fullness after eating mid day meal had an impact on the academic achievement of MDM school children.

• The academic achievement of MDM school children was greatly influenced by the nutritional status of school children.

• The prevalence of nutritional deficiency had a significant impact on the academic achievement of MDM school children.

**Quality and Quantity of Mid Day Meal**

• Out of 5 selected schools, 3 schools were providing good quality of rice, 2 schools were providing good quality of dalia, 1 school was providing good quality of dal (lentil and moong whole).

• Out of 5 selected schools, 2 schools were those where dalia and dal/chawal were not included in the menu of mid day meal.

• Out of 5 selected schools, only 1 school used average quality of soya bean in tahiri and in rest of the 4 schools soya bean was not used in the preparation of mid day meal.

• The average amount of energy and protein supplied to a child by mid day meal was 280.33 Kcal and 9.12 gm, respectively.

• The maximum number of MDM school boys who always eat mid day meal were of 12 years old and least number of MDM boys who always eat mid day meal were of 14 year of age.
Summary and Conclusion

- The maximum number of MDM boys who sometimes eat mid day meal were of 11 years and 14 years of age and the least number of children who sometimes eat mid day meal were in the age of 9 years.

- The maximum number of MDM boys who never eat mid day meal were of 14 years and the least number of boys who never eat mid day meal were of 12 years.

- The maximum number of MDM girls who always, sometimes and never eat mid day meal were of age 13 years, 12 years and 9 years, respectively, where the least number of girls were in age of 11 years, 13 years and 13 years, respectively.

- The maximum number (85.72%) of MDM children who always eat mid day meal were of age 7 years and the least number (69.56%) were 14 years of age.

- The maximum number (16.32%) of MDM children who sometimes eat mid day meal were of age 12 years and the least number (7.14%) of children who sometimes eat mid day meal were of age 7 years and 13 years, respectively.

- The maximum number (17.4%) of MDM children who never eat mid day meal were in age of 14 years and the least number of children (6.12%) were in age of 12 years.

- The maximum number of MDM school boys who always, sometimes and never like mid day meal were of age 8 years, 6 years, and 7 years and 14 years, respectively and the least number of MDM school boys who always, sometimes and never like mid day meal were of 12 years, 8 years and 10 years, respectively.
Summary and Conclusion

• The maximum numbers of MDM school girls who always like mid day meal were in age 6 years, who sometimes like were in age 11 years and who never like were of 12 years. However, the minimum numbers of MDM school girls who always like mid day meal were of 12 years, who sometimes like were of 12 years and who never like were of 6 years.

• The maximum number (57.14%) of MDM children who always have likeness toward mid day meal were of 7 years, and the minimum number of MDM children (36.71%) who always have likeness toward mid day meal were of 12 years.

• The maximum number (33.33%) of MDM children who sometimes have likeness toward mid day meal were of 6 years and the minimum (21.73%) of children were of 14 years.

• The maximum number (32.65%) and minimum number (11.12%) of MDM children who never have likeness toward mid day meal were of 12 years and 6 years, respectively.

• The maximum number i.e. 64.28% and the minimum number 41.93% of MDM boys who always feel full stomach after eating mid day meal were of 8 years and 12 years of age, respectively.

• The maximum number i.e.50% and the minimum number 10% of MDM boys who sometimes feel full stomach after eating mid day meal were of age 7 years and 10 years, respectively.

• The maximum number i.e. 45.17% and the minimum number 14.29% of MDM boys who never feel full stomach after eating mid day meal were of 12 years and 8 years, respectively.
Summary and Conclusion

- The maximum number i.e. 72.74% and the minimum number 50% of MDM girls who always feel full stomach after mid day meal were of age 11 years and 7 and 8 years, respectively.

- The maximum number (33.34%) and the minimum number (12.50%) of MDM girls who sometimes feel full stomach after eating mid day meal were of age 8 years and 6 years, respectively.

- The maximum number i.e. 29.42% and the minimum number 13.63% of MDM girls who never feel full stomach after eating mid day meal were of age 13 years and 11 years, respectively.

- The maximum number i.e. 68.57% and the minimum number 50% of MDM children who always feel full stomach after eating mid day meal were of 11 years and 7 years, respectively.

- The maximum number i.e. 29.54% and the minimum number 11.11% of MDM children who sometimes feel full stomach after eating mid day meal were of 8 years and 6 years, respectively.

- The maximum number i.e. 34.61% and the minimum number 15.92% of MDM children who never feel full stomach after eating mid day meal were of 12 years and 8 years, respectively.

Suggestions and Recommendations

The experience so far clearly shows that MDMs have much to contribute to the well-being and future of Indian children. However, qualitative improvement are urgently required if the meals are to achieve their full potential.

- Financial allocation needs to be enhanced to be able to vary the food menu, increase its nutritional content and quantity to make it a substitute full meal rather than a supplement.
Summary and Conclusion

• Financial allocations need to be raised. Badly funded programs miss a vital opportunity to promote important social goals at a relatively low cost. A moderate amount of additional expenditure could radically enhance the quality of MDMs.

• The infrastructure of MDMs requires urgent improvement. Adequate infrastructure is particularly crucial to avoid the disruption of classroom processes, and also to ensure proper hygiene.

• Class supervision and regular inspections are essential to achieve higher quality standards. Better monitoring would also help to eradicate petty corruption, such as the pilferage of food by various intermediates.

• For the program to be effective and successful there should be active participation from the community including parents and teachers, SHGs, local women groups of the area and panchayat.

• There should be an independent third party evaluation of the program to monitor whether the program is fulfilling the objectives it is supposed to.

• The MDMP could be extended and linked to related programs such as micronutrients supplementation, health services and nutrition education. For e.g. in Karnataka, iron and deworming tablets are provided at school. School children get regular health checkups and free treatment for illness such as anemia, worms and scabies.

• The macro and micro nutrients nutritional needs of children need to be addressed through this program in an integrated manner. The
Summary and Conclusion

scope, nature and extent of fortification need to be explored and evaluated.

- The quantity of cereals (wheat / rice / millet) may be increased to 125 gm per child per day. The recipes should include enough vegetables, particularly dark green leafy vegetables, as far as possible, every day. The menu should be varied to ensure better acceptability of the meals by the children.

- The MDM could make use of dry foods that can be easily preserved without any loss of quality and need for chemical preservatives for about 2 or three days at least, one example is whole wheat flour biscuits (as distinct from maida biscuits generally sold in market by big companies which have a lower nutrition value). All that we would like to emphasize is that the food should be (a) dry (b) preservable for two or three days without adding chemical preservatives (c) high in nutrition and (d) not too expensive.

- The work of preparing whole wheat flour biscuits (or other food items) should be given to SHGs or cooperatives of women from weaker sections. Assuming that about 10,000 biscuits are required in one panchayat for the MDMs/school day, considerable employment can be provided to the women from weaker sections on this basis. It will help to satisfy clearly laid down requirements of hygiene and quality control. As village women will be cooking /baking for their own children, there will be guarantee for maintaining the quality of food.

- This meal should be given to students twice a day, the first one at the start of the school day. This will help those students who have
not eaten a breakfast. The second meal should be given during the normal lunch break in school and that would be in dry form like gram, germinated pulses, fruits.

- Wherever there is adequate space in school, efforts should be made to encourage school gardens involving school children. It is important that apart from nutritive value, hygienic quality of food should also be ensured.

- Teachers should be persuaded to stop viewing the MDM program as a source of disruption and distraction of classroom teaching. So, there should be periodical orientation programs to sensitize implementers, teachers and local community toward the nutritional and educational needs of children.

- There should be a system of monitoring the quality of raw materials used, the hygienic quality of cooked meal and feeding patterns at schools. Feedback forms can be obtained periodically from the children and parents about quality, quantity and other parameters.

- To undertake a system analysis and study models of delivery and innovations that are working effectively.

- There should be synergistic efforts and cooperation from the Department of Health to ensure success of the program.

- Whenever possible, grain and other raw materials should be purchased from local farmers and provided of SHGs.