bolistic steps in our body, we support the recommendations by the Japanese Society for Lipid Nutrition and the ISSFAL to reduce the intake of LA (ω6) substantially to gain more benefits from limited supplies of ω3 dietary fats.

1.3. Effect of Dietary Cholesterol and P/S Ratio of Fatty Acids on Total Cholesterol – Short- and Long-Term Effects Differ

From 1974 to June 1999, 17 clinical studies (556 subjects) used crossover or parallel designs with control groups with 14 or more days of diets that differed only in the amount of dietary cholesterol or number of eggs. Adding 100 mg dietary cholesterol per day increased total cholesterol concentrations by 0.056 mmol/l (2.2 mg/dl) and HDL-cholesterol concentrations by 0.008 mmol/l (0.3 mg/dl).

**Conclusion (by the authors of the original paper):** Dietary cholesterol raises the ratio of TC to HDL and, therefore, adversely affects the cholesterol levels associated with CHD. The advice to limit cholesterol intake by reducing the consumption of eggs and other cholesterol-rich foods may therefore still be valid.

**Our comments:** These data involve changes obtained from a short-term intervention of several weeks. However, habitual intakes of large amounts of cholesterol during longer periods (fig. 2–4) do not correlate with higher TC levels.
Fig. 2
Three groups of daily egg consumption in the Framingham Diet Study

Fig. 3
TC profiles in the three groups of egg intake in Framingham were similar – A long-term effect

Conclusion from figures 2, 3: Within the range of egg intake of this population differences in egg consumption were unrelated to blood cholesterol level or coronary heart disease incidence (relationships between TC and CHD are shown in figures 17 and 18).
**Our Comments:** Despite significant differences in cholesterol intake among the three groups, the TC profiles were very similar to each other and no significant difference was noted in CHD events of the three groups. In epidemiological studies, Inuits ingested roughly 2-fold more cholesterol than Danes, but their TC values were slightly lower. Eggs are important sources of various vitamins, minerals and protein even in industrialized countries.

**Fig. 4**
**Dietary egg is not linked to TC – US National Health and Nutritional Survey (1984–1994)**

Data taken from Song and Kerver [2000].

**Conclusion:** *Egg consumption made an important nutritional contribution to the American diet and was not associated with high TC concentrations.*

**Our comments:** Dietary cholesterol affects TC level very little in the long term (>3 months). People with high TC levels might make daily efforts to eat fewer eggs, but we can find no data to indicate that habitual intake of a large number of eggs causes high TC levels or CHD mortality.
One-week crossover study by Suzuki et al. [1984] (3 cases) and long-term intervention trials to raise P/S ratio and reduce cholesterol intake (7 years in MRFIT Study and 10 years in Helsinki Businessmen Study) are compared.

**Conclusion:** Long-term dietary interventions did not alter TC while the effect was marked in a 1-week crossover study. Smoking rate decreased by 30% in the MRFIT Study, and mortality rates changed in the Helsinki Businessmen Study (fig. 10).

**Our comments:** Raising P/S ratio of dietary FAs and/or reducing cholesterol intake are effective in lowering TC within a few days, but after a few weeks there is an approach to a new plateau from which Keys’ equations were derived [Keys et al., 1957]. In the long term (several years), however, these dietary interventions are ineffective in substantially lowering TC. Serum lipoprotein profiles change shortly after dietary changes, but enzymes in our body adapt to new dietary conditions. Thus, the consequences of short- and long-term nutritional manipulations differ markedly.

One can argue that the ineffectiveness of long-term dietary interventions is due to progressively decreased compliance to the recommendations. However, intervention with dietary advice increased mortality for a subgroup of the MRFIT Study (fig. 9, below) and for the whole group in the Helsinki Businessmen Study (fig. 10; table 4), indicating that a lack of compliance is not likely to be a major cause for the failure to lower TC values.