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Nutrition Close-Up is a quarterly publication of the American Egg Board, written and produced by the Egg Nutrition Center. *Nutrition Close-Up* presents up-to-date reviews, summaries and commentaries on the latest research on the role of diet in health promotion and disease prevention, including the contributions of eggs to a nutritious and healthful diet. Nutrition and health care professionals can receive a free subscription for the newsletter by contacting the Egg Nutrition Center.

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Plasma LDL:HDL Ratio Unchanged Following Cholesterol Challenge

Earlier studies have clearly shown that in most people, normal intake of dietary cholesterol does not measurably raise blood cholesterol levels or CVD risk. However, a small percentage of the population exhibits a higher than average response to increased dietary cholesterol. It has long been thought that these hyper-responders might be at higher risk of CVD unless they decreased their cholesterol intake, but according to a new study by Herron et al., that is not the case. Even though, an additional 640 mg/day of dietary cholesterol did raise plasma cholesterol levels, it did not increase their overall CVD risk, as reflected by an unchanged LDL:HDL cholesterol ratio. In this study of 51 pre-menopausal women (29 Caucasians and 22 Hispanics), with normal cholesterol levels between 140 mg/dl to 200 mg/dl, the study subjects followed either an egg diet or a placebo diet for 30 days each. A three week washout period was included in the study to minimize any potential cross-over effect. During the egg phase, subjects added 3 whole eggs per day (approximately 640 mg cholesterol) to their National Cholesterol Education Program (NCEP) Step 1 diet and the placebo phase used an egg substitute with zero.

Based on the analysis of fasting blood

samples from baseline and post egg and placebo diets, it was shown that ethnicity did not play a role in plasma lipid changes following the dietary cholesterol challenge. However, it was determined that 20 women were hyper-responders with an increase in plasma cholesterol of at least 15 mg/dl (≥ 2.3 mg/dl/100 mg), while 31 women were hypo-responders with blood cholesterol increases of less than 12 mg/dl (≤ 2.0 mg/dl/100 mg). Aside from consuming a higher percentage of calories from protein and a lower percentage of calories from CHO, there were no other dietary and behavioral differences between the hyper-responders and hypo-responders. As theorized, compared to the placebo period, during the egg period hyper-responders experienced significant increases in LDL (19 mg) and HDL (7.3 mg) cholesterol. The LDL and HDL cholesterol concentrations were unchanged in the hypo-responders. But since both LDL and HDL cholesterol levels increased during the egg phase in the hyper-responders, the LDL:HDL ratios were not significantly different from the placebo period (1.80 vs 1.63). However, regardless of the diet, LDL:HDL ratios were the same in hypo-responder at 1.62 (egg diet) and 1.63 (placebo diet). Also, plasma TAG levels remained unchanged in both groups between egg and egg

Plasma LDL:HDL Ratio

substitute feeding periods. Analysis of blood samples showed that, compared to the hypo-responders, the hyper-responders had higher levels of apo B, apo C-III, and plasma CETP activity during the egg period indicating increased rates of cholesterol transport. According to the researchers, in spite of the higher total fat, MUFA, PUFA, and cholesterol intakes during the egg period, and higher fiber and CHO intakes during the placebo period, these dietary factors did not confound the study outcome. The differences in plasma lipid levels in hyper- and hypo-responders following the dietary cholesterol challenge were solely due to dietary cholesterol.

It was hypothesized that hypo-responders were able to maintain their plasma lipid levels with a high cholesterol intake "by decreasing the absorption of

dietary cholesterol or suppressing endogenous synthesis" while hyper-responders processed excess circulating cholesterol by enhancing the reverse cholesterol transport pathway. Even though a higher intake of dietary cholesterol in the hyper-responders was associated with elevated plasma cholesterol, the LDL:HDL ratio "considered best predictor of CHD risk" was well below NCEP's optimum guideline level of 2.5. Therefore, the researchers conclude that "dietary cholesterol restriction is unwarranted" for pre-menopausal women with normal lipid levels.

Herron KL, Vega-Lopez, S, Conde K, et al. Pre-menopausal women, classified as hypo- or hyper-responders, do not alter their LDL/HDL ratio following a high dietary cholesterol challenge. *J Am Coll Nutr.* 2002; 21:250-258.

Key Messages

- Following a challenge diet with 640 mg/day, 20 normal cholesterolemic women raised their LDL and HDL cholesterol levels, while LDL and HDL cholesterol levels were unchanged in 31 hypo-responders.
- In hyper-responders, LDL and HDL cholesterol levels increased by 19 mg/dl and 7.3 mg/dl respectively, however the LDL:HDL ratio did not change.
- Following the egg diet period, plasma TAG levels were unchanged in both groups.
- No ethnic differences in plasma lipid changes following cholesterol challenge were noted.

Phytosterols in Corn Oil Lowers Cholesterol Absorption

In an effort to naturally lower their blood cholesterol levels, many consumers have turned to expensive stanol spreads but, according to a new study, using corn oil may be just as effective. Corn oils are a rich source of phytosterols (0.77% phytosterols by weight), a plant sterol which interferes with cholesterol absorption. The results reported by Ostlund and colleagues suggest that natural dietary phytosterols in corn oil can lower cholesterol absorption by over 25%. These researchers go one step further to suggest that CVD benefits previously attributed to PUFA in corn oil may in part have been due to the phytosterols instead.

In this randomized, double-blind, crossover trial of twenty-five healthy volunteers, the researchers determined changes in cholesterol absorption rates with intake of different phytosterol levels. Aside from different amounts of phytosterol in the test

puddings, calories (413-457 kcal), cholesterol (35 mg hexadeuterated cholesterol tracer), carbohydrate (30.4 gm), and protein (5.4 gm) content were similar between the test puddings. In the first part of this study, 10 subjects were fed pudding with 35 gm commercial corn oil (containing 270 mg intrinsic corn oil sterols) and after 2 weeks, the same subjects were fed a pudding with 35 gm purified corn triacylglycerol with no sterols. Results from this portion of the study showed that, compared to the subjects who ate pudding with corn oil, the subjects who ate pudding with sterol-free corn oil had a 38% higher cholesterol absorption rate. Ostlund et al. determined absorption based on the concentration of hexadeuterated cholesterol tracer in the plasma following the test meal. The 2nd and 3rd part of the study tested the effect of 150 mg corn oil phytosterol and 300 mg corn oil phytosterol, respectively, on

cholesterol absorption. Based on the concentration of hexadeuterated cholesterol tracer measured in the plasma following each test meal, the researchers were able to determine that, compared to the subjects who ate corn oil, the subjects who ate corn oil without phytosterol absorbed more cholesterol (38%). Inversely, the subjects who ate pudding with sterol decreased their cholesterol absorption. For example, cholesterol absorption decreased by 12% with 150 mg sterol, 28% with 270 mg sterol, and 28% with 300 mg sterol.

In conclusion, adding moderate amounts of corn oil to one's diet might be an easy way to decrease the reabsorption of biliary cholesterol as well as dietary cholesterol.

Ostlund RE Jr, Racette SB, Okeke A, et al. Phytosterols that are naturally present in commercial corn oil significantly reduce cholesterol absorption in humans. *Am J Clin Nutr.* 2002;75:1000-1004.

Egg Yolks: Good Weaning Food

Even though we consider breast milk the best source of nutrition for infants, it is low in iron and, as a result, strictly breast-fed infants tend to have lower plasma iron levels. Therefore, the American Academy of Pediatrics recommends iron-fortified cereals as first foods for infants at 4-6 months of age. However, according to the results from Makrides et al.'s study, egg yolks might be a more nutritious alternative to iron-fortified cereals for infants. Aside from the fact that egg yolks contain heme iron, which is better absorbed than the non-heme iron in infant cereal, eggs also contain long-chain omega-3 fatty acids, which have been shown to improve eye and brain development in infants. Some specialty eggs, omega-3 enriched eggs, are a rich source of omega-3 fatty acids. In this study, infants who followed an egg diet had higher plasma iron levels than infants who did not eat eggs; also, plasma omega-3 fatty acid levels were 30-40% higher among infants who ate high omega-3 eggs.

In this dietary intervention study with 82 breast-fed and 79 formula-fed infants, children were tested on one of 3 diets; no eggs, regular eggs, and high omega-3 eggs. Aside from adding 4 egg yolks per week to their regular weaning diet, no other dietary

changes were made. The children were followed from 6 months of age to 12 months of age with physical measurements collected at ages 6, 9, and 12 months. Compared to the regular eggs used in the study, omega-3 fatty acid levels in the high omega-3 eggs were 366 mg higher per egg. This was the only nutritional difference between the 2 types of eggs. Analysis of blood samples taken at 6 months and 12 months of age showed that intake of regular eggs and omega-3 eggs improved iron status without negatively affecting plasma cholesterol levels or plasma indices of allergy. For example, at 12 months, plasma iron was 27% and transferrin saturation was 29% higher in the group with egg intake than the group without egg intake. There was only 1 case of iron deficiency noted in 12 month old breast-fed child who ate eggs. Not surprisingly, the incidence of iron deficiency was much higher among the breast-fed than formula-fed infants (17.1% vs 7.5%). Prior to starting the test diets, plasma cholesterol levels were higher among the breast-fed infants than formula-fed infants (168 mg/dl vs 147 mg/dl), but adding eggs to the weaning diet did not negatively affect plasma cholesterol levels in either group. Also, even though eggs are considered a potentially allergenic food, the incidence of

egg allergy was no different between the egg groups versus the control group. Finally, compared to regular eggs, the high omega-3 eggs raised plasma omega-3 fatty acid levels by 30-40%. By eating omega-3 eggs, formula-fed infants were able to raise their plasma DHA level to the levels of breast-fed infants, who tend to have much higher DHA levels.

Based on these results, it is possible to conclude that egg yolks are good food item to introduce to infants that are transitioning from strictly formula or breast milk to solids. The benefits of egg yolks on plasma iron levels were especially strong in infants with low plasma iron levels. The omega-3 eggs had the added benefit of raising plasma DHA levels by 30-40%. Also, this study did not find that egg yolk intake raised plasma cholesterol levels, caused allergic reactions, or negatively affected intake of other foods.

Makrides M, Hawkes JS, Neumann MA, et al. Nutritional effect of including egg yolk in the weaning diet of breast-fed and formula-fed infants: a randomized control trial. *Am J Clin Nutr.* 2002;75:1084-1092.

COMMON ABBREVIATIONS

BMI: body mass index (kg/m²)
CHD: coronary heart disease
CHO: carbohydrate
CVD: cardiovascular disease
HDL: high density lipoprotein
LDL: low density lipoprotein
Lp(a): lipoprotein (a)

MUFA: monounsaturated fatty acids
PUFA: polyunsaturated fatty acids
PVD: peripheral vascular disease
RR: relative risk
SFA: saturated fatty acids
TAG: triacylglycerol
VLDL: very low density lipoprotein

Eating Dairy Lowers Risk of Insulin Resistance Syndrome in Overweight Individuals

despite what some animal rights and vegetarian advocacy groups say, among professionals in the nutrition community, dairy products are considered very nutritious foods.

Besides being an excellent source of calcium and other micronutrients, they are a dietary staple among western societies. Data from the Dietary Approach to Stop Hypertension (DASH) and Coronary Artery Risk Development in Young Adults (CARDIA) studies support this view.

According to the CARDIA study, increased consumption of dairy products is associated with a 72% lower risk of developing insulin resistance syndrome (IRS) in overweight individuals. Food frequency questionnaires from 3,157 black and white adults aged 18-30 years from 4 US metropolitan areas were used to examine the association between dairy

intake and incidence of IRS. Analysis of the food frequency questionnaires showed that, regardless of body weight, the black cohort consumed less total dairy products compared to whites, and what dairy products they preferred were full fat versions over the low-fat types. As a group, women and those in the lean cohorts ate slightly more dairy foods than men and those in the overweight groups. Dairy intake was directly associated with physical activity, intakes of SFA, whole grain, fruit, and vegetable, and inversely associated with smoking and soda intake. When it came to physical characteristics, overweight individuals were more likely to be dyslipidemic, hypertensive, and have abnormal glucose homeostasis patterns than their leaner counterparts. The incidence of IRS (developing 2 or more components over 10 year) was 4-fold higher in overweight blacks and nearly 5-

fold higher in overweight whites compared with their normal weight counterparts. The odds ratio for IRS was 0.29 for the highest category of dairy intake; compared to people who ate less than 10 dairy products/week, those who ate 35+ dairy products in a week had a 71% lower risk of developing IRS. Further analysis showed that other than dairy, only protein and fiber were significantly associated with IRS.

Based on their findings, Pereira et al. concluded that dairy consumption may help protect overweight individuals against developing IRS. In the case of lean adults, who were already protected from obesity-associated IRS through other lifestyle and genetic factors, dairy consumption did not yield further protection against IRS.

Pereira MA, Jacobs DR, Van Horn L, et al. Dairy consumption, obesity, and the insulin resistance syndrome in young adults. The CARDIA study. *JAMA*. 2002;287:2081-2089.

Severely Obese Children and Adolescents are At-risk for Impaired Glucose Tolerance

as you are aware, obesity is a major risk factor for type 2 diabetes. Sinha et al. studied glucose tolerance in 55 obese 4-10 yr olds, and 112 obese 11-18 yr olds. All study subjects had a BMI that was greater than the 95th percentile for age and sex. Study participants were 55% non-Hispanic whites, 23% African-Americans, and 19% Hispanics.

The results from a 2 hr oral glucose-tolerance test showed that 25% of children and 21% of adolescents had impaired glucose tolerance. Four adolescents had undiagnosed diabetes with a 2 hour plasma glucose level greater than 200 mg/dl. Even though all the kids in the study were obese, kids with a higher BMI were more likely to have glucose intolerance or diabetes.

Both impaired glucose tolerant (IGT) children and normal glucose tolerant (NGT) children had similar fasting plasma glucose levels, but diabetic adolescents and

IGT adolescents had higher fasting plasma glucose than NGT adolescents. Fasting plasma insulin and C-peptide levels were higher in diabetics and IGT children and adolescents. Plasma glucose, insulin, C-peptide levels were higher in the IGT children and adolescents, but plasma insulin and C-peptide levels decreased in diabetic adolescent group to the level of NGT adolescents. Fasting plasma glucose levels were similar between IGT and NGT children, but in older IGT and diabetic kids, fasting plasma glucose levels were higher than NGT adolescents, indicating that their body is unable to regulate glucose homeostasis. Elevated fasting plasma glucose occurred with elevated plasma insulin and C-peptide levels in both children and adolescents. It is not surprising that post glucose challenge, plasma glucose, insulin, and C-peptide level would all be higher among IGT children and adolescents, but similar

plasma insulin and C-peptide level following glucose challenge between NGT adolescents and diabetics clearly indicate that in these adolescents that the beta-cell is no longer working properly.

Based on this cross-sectional study, it is not possible to "determine the sequence of events involved in the transitions from normal to impaired glucose tolerance and from glucose intolerance to diabetes" but this study suggests that insulin resistance associated with hyperproinsulinemia and hyperinsulinemia are risk factor of IGT in children and adolescents. While in IGT kids, beta-cells appear to be working, in diabetics their beta-cells no longer are able to provide sufficient insulin. In conclusion, severely obese children should be tested for impaired glucose tolerance early.

Sinha R, Fisch G, Teague B, et al. Prevalence of impaired glucose tolerance among children and adolescents with marked obesity. *N Engl J Med*. 2002;346:802-810.

Dietary Vitamin E Lowers Alzheimer Disease Risk

Much research has been conducted in the field of Alzheimer Disease (AD), but when it comes to the role of antioxidants on Alzheimer risk, the results are mixed. In an effort to clarify earlier findings, 2 prospective studies were conducted by Engelhart et al. and Morris et al., which unfortunately, have not really clarified the issue since in some aspects, their results different from one another.

In the study by Engelhart et al., 5395 non-institutionalized Dutch adults over the age of 55 and free of dementia at screening were followed for 6 years. One hundred forty-six cases of AD were diagnosed during the follow-up period. Analysis of baseline dietary and clinical information showed that vitamin C and vitamin E intakes were inversely associated with AD risk. Compared to the group with the lowest vitamin E and C intakes, the group in the highest tertile for vitamin E and C had an AD risk that were 43% and 34% lower, respectively. However, among current smokers, high intake of all 4 antioxidants, vitamin C, vitamin E, beta carotene, and flavonoids were related to

lowered RR for AD, but this was only significant with beta-carotene. Genotype also made a difference in the relationship between intake of antioxidants and risk of AD. Higher intakes of beta-carotene, vitamin C, and vitamin E lowered AD risk in participants with at least 1 apo E 4 allele but not in individuals without an apo E 4 allele. Compared to earlier antioxidant and AD research, which mainly consisted of supplement studies, the results from Engelhart and colleagues may be more applicable since they tested the efficacy of antioxidants from food sources, thereby reducing bias commonly associated with supplements (short duration of study period, healthier lifestyle among supplement users, and nutrient interactions). Engelhart et al. hypothesized that antioxidants may decrease the level of oxidative stressors in the brain, thereby lowering the cause of cell death. In conclusion, vitamin E and C are thought to decrease AD risk among older Dutch citizens.

Like Engelhart et al., the study by Morris et al. also found that vitamin E was helpful in protecting against AD. However,

this study found no relationship with other antioxidants, only with vitamin E. Another unexpected observation they noted was that vitamin E intake lowered AD risk only among individuals without the apo E4 allele, which is contrary to the findings reported by Engelhart et al.

The study by Morris and colleagues included 815 people over 65 years old and free of AD at baseline. The mean follow-up period was 3.9 years. Based on the information collected on these older adults from the south side of Chicago, it was determined that the RR (95% CI) for AD were 1.0, 0.71 (0.24-2.07), 0.62 (0.26-1.45), 0.71(0.27-1.88), and 0.30(0.10-0.92), respectively, from lowest to highest quintile of vitamin E intake. Vitamin E supplements did not protect against AD, only dietary sources of vitamin E. This study also found no ethnic difference in AD and its relationship with vitamin E.

Engelhart MJ, Geerlings MI, Ruitenberg A, et al. Dietary intake of antioxidants and risk of Alzheimer Disease. *JAMA*. 2002;287:3223-3229.

Morris MC, Evans DA, Bienias JL, et al. Dietary intake of antioxidant nutrients and the risk of incident Alzheimer Disease in a biracial community study. *JAMA*. 2002;287:3230-3237.

Fish Intake Lowers Plasma Leptin Levels

The news that fish intake lowers CVD risk is not new, but according to results from the Lugalawa Study, fish intake can also lower plasma leptin levels, which has been shown to lower CVD risk. While this theory does not refute the antithrombotic role of omega-3 fatty acids as the primary mechanism behind the inverse relationship between fish and CVD risk, it does suggest additional benefits.

Using the eating pattern and anthropometric data of 2 homogeneous African populations of Tanzania, Winnicki et al. were able to show that plasma leptin levels were significantly lower in a tribe consuming a diet rich in fresh water fish

(n=279) than in a tribe with a diet primarily of vegetables (n=329). For example, at the same BMI, the plasma leptin level was 2.5±2.0 ng/ml in male fish eaters and 5.0±1.9 ng/ml in female fish eaters, while the vegetarian diet counterparts had plasma leptin levels of 11.2±2.4 ng/ml and 11.8±1.4 ng/ml in men and women, respectively. Aside from their diets there were no other major differences between the 2 study groups. Multivariate analysis indicated that "plasma insulin levels were strongly and independently associated with plasma leptin levels for all group or subgroups studies (p<0.001 for all comparisons)." However, unlike earlier studies, this study

only found a weak positive association between plasma leptin and body fat among women who ate fish. No such relationship was seen in men or in the vegetarian groups. Based on their findings, Winnicki et al. concluded that omega-3 fatty acids may improve leptin sensitivity by regulating the expression of the leptin gene in adipose tissue in Tanzanians. These results added to a large data set showing the importance of adding fish to a healthy balanced diet.

Winnicki M, Somers VK, Accurso V, et al. Fish-rich diet, leptin, and body mass. *Circulation*. 2002;106:289-291.

Atkins' Diet Improves Lipid Profile and Body Composition in Men

during a USDA sponsored "Great Debate" symposium, Dr. Robert C. Atkins, the author of "Dr. Atkins' New Diet Revolution" was challenged by another panelist to fund a study testing the efficacy of his ketogenic diet. And according to the results from that Atkins' funded study in normal-weight men, a ketogenic diet resulted in improved lipid levels as well as reduced body fat mass. In this study, 12 men followed the ketogenic diet, which consisted of 30% of calories as protein, 8% CHO (<50gm/d), and 61% fat, and were compared to a control group with 8 men who continued to follow a regular diet, which consisted of 17% protein, 47% CHO, and 32% fat. Sharman et al. investigated effects of the ketogenic diet on serum biomarkers for CVD risk and Volek et al. looked at changes in body composition and hormonal responses following intake of a ketogenic diet.

In the study by Sharman et al., the researchers assessed body weight and fasting blood samples at weeks 0, 3, and 6, while postprandial TAG and insulin responses were measured at weeks 0 and 6 in the case group. In the control group, body weight and blood samples were measured at the start and end of the study. Intake of the ketogenic diet resulted in small decreases in body mass (4.8 pounds), fasting serum TAG (33%), post prandial lipemia after a fat-rich meal (27%), and fasting serum insulin levels (34%). Overall, fasting serum total and LDL cholesterol and oxidized LDL were unaffected, and HDL cholesterol tended to increase with the ketogenic diet (11.5%), but there was a large intra-individual response to the ketogenic diet on the overall CVD risk profile. Also, according to the researchers, the ketogenic diet lowered CVD risk by

significantly increasing the peak LDL particle size. For example, after the ketogenic diet, 3 of the 5 pattern B subjects' switched to pattern A, which has been shown to be less atherogenic. No appreciable change in plasma lipid and body mass was noted in the control group.

Based on their findings, Sharman and colleagues concluded that the ketogenic diet, which is high in both fat and saturated fat, does not adversely affect biomarkers for CVD in healthy men. In fact, instead of jeopardizing health as many believe, by lowering plasma TAG levels, raising HDL cholesterol levels, although not significantly, and increasing peak LDL particle size, the ketogenic diet might even improve ones health.

In the second study, Volek et al. examined the effect of ketogenic and regular diets on body composition and hormonal responses in the same cohort studied by Sharman and colleagues. The 12 healthy men in the test group were 36.7 years old and weighed 174 pounds, while the 8 control subjects were 35 year old men and weighing 188 pounds. Even though the subjects were encouraged to maintain their body weights, the test group lost 4.8 pounds and the control group gained 0.8 pounds during the 6 week study period. This weight loss may have been in part due to lower caloric intakes with the ketogenic diet. A closer look at the changes in body composition showed that fat mass decreased by 3.7 pounds at week 3 and 7.3 pounds at week 6, while lean body mass increased by 2.4 pounds during the study period. Also, results from the metabolic and hormonal response measurements showed that BUN values increased by 43%, the BUN/creatinine ratios increased by 45%, serum insulin concentrations decreased by 34.2%, and total T4 and free T4 indices increased by 10.8% and 12.5%,

respectively. According to the researchers, an elevated BUN level was probably due to the higher protein intake rather than an indication of renal stress. Finally, β -hydroxybutyrate concentrations were elevated with the ketogenic diet, indicating that the test group was following the low-CHO diet. Hormonal status and body composition did not change in the control group.

Based on their study findings, as well as other studies, Volek et al. theorized that the elevated β -hydroxybutyrate following the CHO-restricted diet may decrease fat mass by up-regulating the mobilization of adipose tissue fat, while a decrease in serum insulin levels following the CHO-restriction diet may inhibit lipolysis. In light of the growing weight problem in society, the benefits seen following the ketogenic diet, decrease in body fat mass without negatively affecting lean muscle mass, warrants further investigation.

In the past few months the tide has begun to change for low-CHO/high-protein diets. They have been fueled by positive findings such as these studies supporting the efficacy of these diets on weight loss without negative health effects. However, it must be recognized that most of these studies were conducted on a small number of volunteers and over a limited time period. One solution to the current obesity problem may include a ketogenic diet, but it is far too early to be certain.

Sharman MJ, Krawmer WJ, Love DM, et al. A ketogenic diet favorably affects serum biomarkers for cardiovascular disease in normal-weight men. *J. Nutr.* 2002;132:1879-1885.

Volek JS, Sharman MJ, Love DM, et al. Body composition and hormonal responses to a carbohydrate-restricted diet. *Metabolism.* 2002;51:864-870.

Editorial

Sensory Overload and Comatose Outrage

in the last issue of Nutrition Close-Up we included a section called "You've Got to be Kidding Me News" which had two reports in it. One dealt with an ALF (Animal Liberation Front) bit of insanity and the other with PCRM (Physicians Committee for Responsible Medicine) antics. Now I figured that with over 50,000 readers I'd get e-mails and phone calls calling me to task for the outrageous ALF piece which was, in fact, a satire taken from The Onion web site (http://www.theonion.com/onion/3420/animal_rights.html). Well, one person called and wanted to know what was the source of the story and a reporter called wanting to get details. A response factor of 0.002%. That means that the remaining 99.998% of the readers either didn't read the piece or, if they did, they found it so outlandish they knew it wasn't true, or they just considered it another story about some extreme acts by a bunch of nut cases. Now I'll accept that fact that a lot of you don't read this missive from front to back but I sure hope that some would. And no doubt some read the heading and the piece and chuckled. But probably for some it was just another example of the sensory overload we

experience daily. A sort of anesthetized sense of outrage which has reached chronic condition due to the incessant barrage of media coverage of just how insanely offensive some of the antics of activists can be. The real concern is that this anesthetic seems to work since, without public outrage to the deplorable excesses, we allow those who use these tactics to eventually achieve their goals. In a place like Washington DC, where there are innumerable advocacy groups, many very good and many not so charming, there is simply such a barrage of false claims, dissemination of misinformation, unnecessary exaggerations, and propagation of outright lies going on all at once which easily keeps anyone from questioning that which needs to be questioned because of the energy spent just trying to get the facts. And then stagnation becomes the norm which was the goal in the first place. Without outrage and without facts we risk falling into the trap described by the Irish philosopher and statesman Edmund Burke, "The only thing necessary for the triumph of evil is for good men to do nothing."

As we become more and more accustomed to the outrages, we leave more

and more of the process to those with their own agenda so long as some of us can duck back into our safe havens and wonder why the world works like this. Pets become companions with legal rights; medical research using animal models is curtailed through violence: schools ban foods because of fat or sugar or calories; you're told what you should and what you should never, ever eat; and the lemmings continue to fall into the ocean. ELF burns down a resort, so what. PETA scares the public with lies, so what. ALF puts a farmer out of business, whatever. Not my problem, not my pocket, not my world. Don't bet on it!

The one inevitable consequence of it all is that one's life no longer is under one's own control but rather under control of those with the strongest voices and the weakest senses of restraint and cooperation. But then again, maybe everyone knew it was a farce and none of my concerns are real. I'm a lot more comfortable with that thought because then I don't have to worry about it.

*Donald J. McNamara, Ph.D.
Executive Editor, Nutrition Close-Up*

A Short History of Medicine

I have an earache:

- 2000 B.C. - Here, eat this root.
- 1000 A.D. - That root is heathen. Here, say this prayer.
- 1850 A.D. - That prayer is superstition. Here, drink this potion.
- 1920 A.D. - That potion is snake oil. Here, swallow this pill.
- 1965 A.D. - That pill is ineffective. Here, take this antibiotic.
- 2000 A.D. - That antibiotic is artificial. Here, eat this root.

ENC will be exhibiting at the National American Dietetic Association's Food and Nutrition Conference in Philadelphia, Pennsylvania, October 19 - 22, 2002. .

- Please come and visit us at our booth (#1422). We have many new education materials for you to pick-up.
- We are also sponsoring a session on Choline and Iron: Emerging Nutrients in Fetal Development. It will be on Tuesday, October 22, 2002, at 8 a.m. Look in the program for location.

Breastfed Babies Grow-up to be Smarter Adults

As a result of earlier studies which reported a positive association between breastfeeding and cognitive and intellectual development in infants, most women have learned that breastfeeding is best for their babies. But now according to Mortensen et al., the benefits of breastfeeding last beyond childhood. These investigators found that adults that were breastfed longer as a child scored much higher on intelligence tests than adults that were breastfed for a short time as a child.

In this study using demographic, socioeconomic, and prenatal and postnatal medical data from the Copenhagen Perinatal Cohort, Mortensen and colleagues showed that duration of breastfeeding was associated with higher scores on the Wechsler Adult Intelligence Scale (WAIS) and Børge Priens Prøve (BPP), 2 standardized intelligence tests. The mean ages at which WAIS and BPP

tests were performed was 27.2 and 18.7 years old, respectively. The IQ scores on the unadjusted WAIS test averaged 98.1 in the group with less than 1 month of breastfeeding, 101.3 with breastfeeding for 2-3 months, 103.3 for 4-6 months, 108.2 for 7-9 months, and 102.8 for more than 9 months. It was shown that 28% of subjects who were breastfed for less than 1 month as a child had an IQ of less than 90, compared to only 4% and 5% of the 2 groups with the longest breastfeeding duration, respectively. The results from the verbal and performance IQ tests also showed similar trends. Based on these data, the researchers concluded that there was no additional intellectual benefit from breastfeeding beyond 9 months of age. The results from the BPP study administered by the Danish military draft board on 2280 male cohort in this study found a similar outcome. Adjustments for social and perinatal factors slightly weaken this

relationship between intelligence and duration of breastfeeding, but the relationship remained statistically significant. In addition, the study by Mortensen et al. indicated that breastfeeding was positively associated with social status, education, birth weight, birth length, and mother's age, but negatively associated with single mother status and cigarette smoking.

In conclusion, Mortensen et al.'s study indicates that breastfeeding has long-term benefit on cognitive and intellectual development. However, breastfeeding beyond 9 months was not associated with further benefit. The researchers concluded that "the nutrients in breast milk, behavioral factors, and factors associated with choice of feeding method may all contribute to the positive association."

Mortensen EL, Michaelsen KF, Sanders SA, et al. The association between duration of breastfeeding and adult intelligence. *JAMA*. 2002;287:2365-2371.

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