

# **KOFINAS PERINATAL** *Providing care to the unborn*

UPDATES ON PERINATAL ISSUES AND NEWS ABOUT KOFINAS PERINATAL

## **Fetal Nutrition and Adult Health**

*Part II: the nutrition*

**Maternal nutrition during intrauterine life defines neonatal and adult health**

*Alexander Kofinas, M.D.*

### *Kofinas Perinatal baby of the month*

*My sweet little angel, Eva Mikayla, was born September 25, 2009 at 1:40 P.M. weighing 7 pounds, 3.5 ounces and 20 inches. Eva is now four months old and is our miracle baby. Our little angel was the most precious gift we have received in our lives. Words could not express the happiness and love she has brought into our family. We had struggled over the past seven years, but when Eva was born and placed into my arms, it was all worth the wait and experience. When I look at my daughter and the way she smiles, cries, babbles and sucks her little thumb, she makes us forget all the pain and suffering. She is lovable, adorable and when I hug her, we give each other the comfort and security of a mother and daughter, which is a special feeling and bond. Our daughter is a gift of eternal happiness to me and my husband.*  
*Proud Parents*



In the January issue of the newsletter we discussed the physiology of fetal nutrition and adult health. If you have not read yet that article, please do so before you continue with this one. It will make it a lot easier for you to understand the current article and thus help you help your baby and future adult. The fetus is totally dependent on his/her mother for all the nutrients that are required for a complete and healthy development. In the discussion below, we will operate under the assumption that the placenta of every fetus is as close to perfect as possible. We understand that this is not true in many of the pregnancies, but we will accept this assumption to be true in order to be free to examine the influences of maternal nutrition in isolation from other factors.

I would like to make a very important comment regarding the timing of “fetal nutrition”. The maternal body is a machine that consumes energy in the form of food-stuff and converts it to other forms of energy that help the body grow and maintain its daily functions that are essential for a healthy living. The daily intake of nutrients should meet some minimum requirements in terms of quantity as well as quality. Body composition is a very essential component of the day-to-day utilization of the nutrients we consume. A well balanced body with normal composition should contain proportional amounts of water, fat, lean mass and essential dietary elements such as vitamins, trace elements, antioxidants etc. Such a body should then consume only the amount of nutrients that it

needs for the daily basic functions. During pregnancy, the presence of the fetus requires more nutritional supplies equivalent to the needs of the fetus. As we discussed in Part I of this subject, the average increase in caloric demands during pregnancy is 20,000 calories or approximately 70 calories per day. If we assume that the maternal body composition is well balanced then the addition of the 70 calories per day would be enough to provide for healthy and complete fetal development. However, we must be very careful here; there are empty calories and nutrient-rich calories. Empty calories are the calories that provide a lot of energy but little in terms of nutrients. Refined carbohydrates are such an empty calorie food. This is unnatural and very unhealthy. You must make an extraordinary effort to consume nutrient-rich calories. For example, eating whole grains is a lot different than eating bread. Even the so-called whole-wheat bread that is sold in supermarkets most of the times is not really whole-wheat. It is the product of refined white flour mixed with bran. Whole-wheat products contain intact portions of the grain's components. This is very important because such foods

are dense in nutrients in contrast to refined foods. In addition, when we consume whole grains, their digestion and absorption is slow and gradual. This means that the carbohydrates in these foods are absorbed slowly in the course of the digestive process and thus blood sugar levels remain in the normal levels. As a result, the secretion of insulin is under steady and healthy control. In contrast, the consumption of refined carbohydrates, leads to excessive elevations of blood sugar and in turn, excessive elevations of Insulin. Such Insulin elevations lead to metabolic disturbances that are responsible for the so-called metabolic syndrome. Similar changes to the baby's metabolism can cause permanent



alterations on the baby's metabolism that can affect the baby for the rest of his/her life.

The distinction of "nutrient-dense calories" and "empty calories" is very important to understand. Empty calories are calories that provide a lot of energy but not enough nutrients (vitamins, anti-oxidants, minerals, essential amino acids, essential fatty acids etc.). Foods that provide empty calories are mostly foods derived from refined carbohydrates such as bread, starchy products, pasta related foods, sugar, etc. In contrast, foods that are nutrient rich are vegetables, fruits, whole grains, meat, fish, eggs, dairy products, olive oil etc.

Pregnancy is a unique opportunity for the mother-to-be to educate herself on healthy

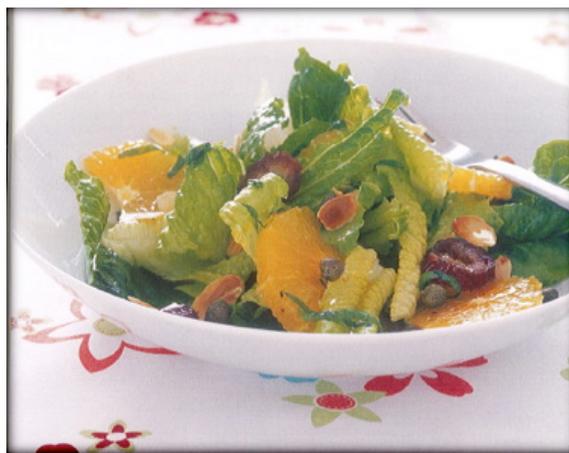
nutrition matters. The baby becomes a strong motivator and most pregnant women are willing to sacrifice a lot for the health of their unborn. What is important here however, is for the mother to continue to apply the principles of healthy nutrition she acquired during the pregnancy for the rest of her life. Eating healthy during the pregnancy is not enough.

The mother should continue practicing healthy eating habits long after the baby is born. Healthy nutrition should be a life-long skill and requires a lot of discipline. I understand that modern lifestyles of working women make it very difficult to adhere to the process of preparing a healthy meal. It is tempting to pick-up the phone and order pizza, or Chinese food instead of preparing a healthy nutritious meal from scratch with fresh ingredients. Finally, as we all know our environment is heavily polluted with thousands of industrial toxic substances (dioxins, endocrine disruptors, carcinogens, PCBs, etc.). These substances have found their way to every aspect of our lives. There is truly "no place to hide" from

such pollutants. We all must make every effort to use organic foods to the best of our capacity for the preparation of our daily meals. It is unfortunate that many of us have no access to such foods for logistic and /or financial reasons. Such foods appear to be expensive in comparison to the conventional produce, which is the result of heavy use of chemical-rich and nutrient-poor fertilizers. If one considers the ultimate cost of poor nutrition during our life span, one will quickly realize that spending a few dollars a day for healthy organic food today, will pay us back handsomely in the future with a healthy and disease-free life.

What should a pregnant woman then eat and what should she avoid?

This is the most important question. Giving a detailed answer to this question would require a whole book. This newsletter is too small to give us the opportunity to provide all the answers to this important question. We will try to provide as much information as possible in this limited space. We hope in the future to find the time to publish a complete textbook full of specific advise for a complete, life-long educational experience on the matters or healthy nutrition. A lot of modern mothers to be are health conscious and are under the impression that they eat in a healthy manner. Unfortunately, if one questions such women about their typical breakfast, lunch and dinner, one quickly realizes that their diet is in reality far from healthy. The typical American diet is too rich in refined carbohydrates and unhealthy fats containing mostly omega-6 type of fatty acids, and clearly unbalanced in regards to the various kinds of foods. A healthy diet should be comprised of well-balanced protein (lean meat, poultry, fish), vegetables, whole grains, legumes, fruits and healthy unsaturated fats. In addition to the balanced diet, most women should take a



multivitamin and folic acid prior to conception and during pregnancy. Women tend also to be deficient in iron due to the monthly menstrual blood loss. During pregnancy, the baby demands a significant amount of iron; fetuses have their way to absorb iron actively from the maternal blood and if the mother is deficient in iron, then she will become anemic. Anemia has been associated with fetal growth failure, preterm delivery and other pregnancy complications. Women who suffer from preexisting medical conditions should make every effort to control such conditions prior to conception. For example, diabetes should be well controlled prior to conception or else it increases the risk

for fetal loss and congenital defects. Hypertension like-wise should be controlled prior to conception in order to optimize the outcome of the pregnancy.

## Best food choices for a healthy fetal nutrition.

This section will present the various foods in a way that is understood by most women. Our purpose should always be to take the appropriate amount of total calories but more so to obtain nutritious (nutrient dense) calories.

## Bakery and grain products

Grains are the primary source of dietary carbohydrates. Grain products occupy almost 80 % of supermarket selves. Pasta, bread, cookies, cakes, corn syrup, crackers and a large number of processed foods have their origin in grains. This does not make them healthy foods however. As we mentioned previously, refining

of grains makes them very easy to digest. In fact, most of the refined carbohydrates are so easy to digest that by the time they touch our tongue, they are converted to sugar. This easy digestion causes increased amounts of sugar to be absorbed in a very short period of time. This forces our body to produce excessive amounts of insulin (hyperinsulinemia) which, in the long run causes many chronic diseases such as diabetes, hypertension, heart problems, stroke, cancer growth and kidney problems. In addition, the refining process removes all the components of the grain that contain the most nutritious parts. As a result, the consumption of refined carbohydrates is primarily consumption of empty calories. For this reason, it is of paramount importance to make every effort to consume grain products that are minimally or not refined at all. You must choose always or most of the times whole grain products; for example, whole-wheat pasta, wild rice, whole wheat or barley instead of refined rice etc. Avoid refined carbohydrate products that are prepared with trans-fats and products that are sweetened with corn syrup. Corn syrup is so pervasive in these processed foods that it is very difficult to find any such food that does not contain a significant amount of corn syrup. I was amazed to discover that most of the pickled vegetables, contain significant amounts of corn syrup. If you have to have crackers, chips, breads and other baked products you must select only the ones that do not contain the unhealthy hydrogenated oils (trans-fats).



## Fat containing foods

Over the past 60 years, fats have in general been ostracized as the evil of all foods. This is unfortunate and very damaging to the overall health. Fat is a very essential component of our diet for thousands of years. What our bodies were not made to consume, is refined carbohydrates. Today, with all the bad publicity of fat most Americans reduced the fat consumption by 10% but they continue to get fatter and fatter. This is because by reducing the fat, they reduced also the protein that comes with it. As a result, they replaced the missing calories with the unhealthy refined carbohydrates. This in fact is the sole reason for the epidemic of obesity and diabetes in this country. Such behaviors are promoted heavily

by the all-mighty food industry that controls most if not all of the regulatory agencies such as the FDA and not only. Cholesterol is the base for the production of most of the vital hormones. Eating healthy fats not only does not affect our cholesterol levels but it is healthy for our entire body.

Most of your baby's brain is comprised of fat. Without healthy fats in your diet fetal brain development is severely compromised. Omega-3 fatty acids that are found in fish, eggs, and nuts help reduce bad cholesterol, increase good cholesterol, bring balance to our coagulation system preventing clotting disorders and are the most important component for healthy development of your baby's brain. Eating fish for example would be the ideal food in terms of omega-3 consumption. However, due to extensive contamination of the seas from Mercury, dioxins

and other carcinogens and heavy metals, fish is not as healthy a food anymore. During pregnancy one should not consume fish more than twice a week and it should be of the varieties that are the least contaminated. In general, one should only eat wild fish, and not farm-raised. The smaller the fish the less contaminated. Large fish such as swordfish, tuna and large predator fish should never be eaten because the damage exceeds by far any nutritional benefit. Wild Alaskan salmon is healthy but farm raised salmon is not. Shrimp, scallops and oysters contain very little mercury and are safe as long as they are cooked. Other safe to eat fish include cod, Atlantic mackerel, haddock, anchovies, sardines and herring. A safe alternative to fish consumption during pregnancy is

supplements containing DHA that is produced from algae. As for the animal fat, one should always try to eat meat that is raised naturally (grass fed) and not the industrial corn fed beef. Fat from corn fed animals is high in very low density lipoproteins that are the most harmful and responsible for plaque formation in our vessels. Unhealthy fats during pregnancy are also known to cause atherosclerotic lesions in the placental vessels of both, the mother and the unborn.



we should take some of our protein from animals and some from plant related products. This will ensure the availability of the additional nutrients that are unique to plants and are complementary to the ones found in animal derived proteins. The consumption of animal protein is by definition associated with the consumption of fat also. Fish derived fat is the healthiest fat because it is rich in omega-3 fatty acids. Animal fat is 50% saturated fat and the rest is polyunsaturated. This is more true with grass-fed animals than corn fed ones. Eating the appropriate amount of protein during pregnancy means no more than 20% of the total calories. Eating more protein can be harmful due to its negative caloric effect. Protein is a structural food that is best used for the building

blocks of our bodies. If we eat more protein than we should, then we spend more energy to convert protein into sugar than the energy it provides us when it is burned. When a group of malnourished women were placed on a high protein diet, they delivered babies that were small for gestation. This is the equivalent of putting a fetus on

an Atkin's diet. Too much protein has the opposite effect on fetal growth.

## Protein containing foods

Protein is found in both, animal meat as well as earth products (nuts, legumes, etc.). Animal derived proteins are the "ideal complete" food. Animal meat contains all the essential aminoacids and essential fatty acids. In contrast, plant derived proteins are incomplete. However, taking a balanced protein approach means that

## Dairy products

One glass of milk contains 300 mg of calcium; like-wise, 1 ounce of swiss cheese contains the same amount of calcium. Milk and cheese as well as other dairy products are a good source of high quality protein, a small portion of carbohydrates and of course animal (saturated) fat. Low fat or fat free dairy products are closer

to a balanced diet with protein, fat and carbohydrates. Regular unsweetened yogurt is preferable and much healthier than frozen yogurt that contains huge amounts of sweeteners such as corn syrup. In contrast, yogurt with added portions of various fruits can be a very healthy and nutrient dense food. In addition, yogurt provides a small amount of probiotics. Unfortunately, pasteurizing kills most if not all of the probiotic bacteria. For this reason, pregnant women should be advised to take at least one tablet or capsule of probiotics daily. Probiotics are known to improve intestinal function, regulate the gut immune system and prevent genital and urinary tract infections. Women who take probiotic supplements during pregnancy are half as likely to have children with food allergies.

## Fruits and Vegetables

Our ancestors thousand of years ago received all of their carbohydrates from fruits and nuts. Such carbohydrates comprised approximately 20% of their calories; the rest was from animal meat and fat (game). Fruits contain in addition to the fructose a large amount of various vitamins and antioxidants. Vitamins help our cells function properly and antioxidants neutralize “reactive oxygen species” that damage our cells and promote premature aging. Fruits also provide a significant amount of water, minerals and fiber. Fiber promotes a healthy intestine and minerals are essential in the various metabolic processes as well as for the creation of electrical signals for the transmission of messages by the nerves



to the various organs as well as across the membranes of the cells. Vegetables are rich in water, fiber, minerals, vitamins and various important antioxidants. Vegetables also contain protein and fat albeit in smaller quantities than the legumes and nuts. Ideally, all the carbohydrates should be provided by means of fruits and vegetables. Potatoes for practical purposes should not be considered vegetables. Potatoes contain so much pure simple carbohydrates that they are equivalent to plain sugar. I understand that potatoes in all their forms are a significant part of the American diet but this does not make them any healthier. Dry fruit that is not sweetened with extra sugar is healthy also but

one should remember that dry fruit is high in sugar and it is easier to eat more than when one eats fresh fruits which, are balkier and more filling. The frozen varieties of fruits and vegetables are acceptable but the canned should be avoided due to added sugar and corn syrup. One thing that I would like to remind you here is that organically grown fruits and vegetables are much better and nutrient

richer than conventionally grown ones. To the extent possible, you should seek to get only organic produce unless not available. Although organic fruits and vegetables are preferable to conventionally grown, conventionally grown fruits and vegetables are far more important than no fruits at al. Like-wise a glass of natural fruit juice is better than nothing but eating the whole fruit is the perfect thing to do.

## Foods and substances you should avoid during pregnancy

- Be aware of your environment and try to avoid exposure to industrial contaminants. On average, all newborns are born loaded with about 300 industrial man made toxic substances. This is enough! ( see relative document on the link: <http://tinyurl.com/yav5pu7> (Read the document “Nowhere to hide..).
- Avoid large fish and fish that is not known to be low on toxic substances. If you are not sure of the origin and quality of your fish avoid it and instead take a daily DHA supplement. <http://tinyurl.com/yav5pu7> (Read the document “Fish consumption in pregnancy).
- Avoid eating uncooked meat products to reduce the risk for toxoplasmosis.
- Wash your vegetables well to avoid parasitic infections.
- Limit coffee and caffeine containing beverages to no more than 2-3 drinks a day.
- Avoid all highly refined carbohydrate products and all prepackaged meals.
- Avoid meat from corn fed beef. Choose instead meat from grass fed cattle.
- In your salad you should only use virgin olive oil and avoid all vegetable oils and ready-made dressings. Making your own olive oil based dressing and keeping it in the refrigerator for a few days is much healthier than all commercial dressings.
- If you like to sweeten your beverages, use natural sweeteners such as Stevia. Avoid



- completely all commercially available sweeteners because they act as endocrine disruptors and can cause significant hormonal changes to your body and to your baby's body.
- Avoid cold cuts unless you cook them. Toxoplasmosis and Listeria are serious parasitic infections that can damage your baby.
- Wash your hands with soap thoroughly prior to handling vegetables and do the same before and after you handle raw meat.
- When you process vegetables and raw meat on your counter, make sure you wipe clean and wash with soap to avoid contaminating your counters with parasites that can infect everything you place upon your kitchen counter.
- Avoid exposure to volatile chemical substances such as gasoline fumes, oil based wall and furniture paints etc.
- Avoid using cookware that is treated with anti-stick surfaces (Teflon). Cooking on such cookware produces volatile chemicals that act as endocrine disruptors. Use cast iron cook ware if possible and glass instead of plastic.
- Avoid using plastic bottles. Even more so, you should never use plastic food containers in the microwave.
- Avoid the use of all kinds of highly processed foods that contain additives with names you do not understand.
- Avoid using new cosmetic (bath) products that contain new and untested chemicals. Instead, try to use simple soap and old fashioned cosmetics.