The

WHOLE GRAIN CONNECTION

Aiming to enhance the desirability and availability of 100% whole grain breads, and other 100% whole grain products, from organically and sustainably grown grains, and thereby connecting farmers and bakers

Newsletter Number 5 August 2002

Californian wheat and weather as seen in April 2002

September marks the beginning of the rainy season throughout California, and usually the first rains are gentle and barely more than Scotch mists. The real rain that gets the plants growing, generally appears between December and March. In the fall of 2001, the rains soaked the land early and by Thanksgiving a perennial prediction in northern California, that is often unheeded, became a reality, that planting must be done before Thanksgiving, or the fields could be too muddy to work. Then from February onwards in 2002, the rains were much less than usual, so that the planting window of a dry spell in early February gave way to insufficient rain to sustain late plantings well.

Results from September plantings

Two farmers planted wheat in September. One planted early, in Merced county, to make use of all the precipitation available in the season. But the varieties planted were all short season or spring types, and they grew fairly well at first but headed up into frost, and were severely damaged. So, mortified, the farmer decided to plough everything under and try again next year remembering the locally sung mantra, that wheat should be planted in January there. So here's hoping that the short season wheats will indeed be better able to thrive by planting in January, in Merced county.

The other farmer, in Butte county, also planted early and in September, his reason was to keep the land covered for as long as possible, as a means of combating weeds. Fortunately his choice was for the *White Australian* wheat, which is the only variety, that we have multiplied, that has a distinctly long growing season and which could almost be called a winter wheat. To date it has flourished and should soon be heading up into the beginning of the hottest weather, in May.

Ideally the wheat variety finally chosen by a farmer should be able to withstand the extremes of local weather conditions, provided it is planted at the best time. Choosing the best time is the task of the farmer, and with an unchanging wheat variety that choice will become easier and easier each year.

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Straw bale houses

There in the San Francisco Chronicle Magazine on February 3, 2002, was the story of a straw bale house, by M.E.A.McNeil. At first glance strange in its design, but at second and third glance ever more delightfully functional and welcoming. This one was being built for composer Lou Harrison; the house is a long tall arch-roofed nave with flying-buttress-like shading walls down one side, and an end window patterned with lacy woodwork.

The story was thrilling for many reasons. One in particular was the realization that stucco-ed straw bale buildings could be built on a wheat farm without the need to import the bulk of the building materials. The functionality is magnificent: super insulation against heat and cold, seismic stability, and surprising fire resistance. Aesthetically the stucco finish can be gorgeous, and can draw on the best of Mediterranean and Middle Eastern architecture, or an adobe style simplicity can become part of a garden landscape.

For anyone seriously wanting to build a home with straw bales it has been an uphill battle, because permits for such buildings are difficult to obtain. But according to McNeil's article, the trend towards understanding and accepting straw bale buildings is rapidly increasing. In California there are now 50 builders specializing in straw bale building, so obtaining that necessary building permit must be easier than it was 5 to 10 years ago. Hidden Villa in the Los Altos Hills of Santa Clara county has been a site for enlightenment during this time. At first they built a tiny produce vending shelter, but more recently straw bales have been incorporated in the structure of their new Environmental Education Center. How about a farm kitchen and bakery built from straw bales, and meeting all the requirements for health authority permitting? Who will be the first to do this among California wheat growers?

Just to keep things in perspective, looking into the website: strawhomes.com, was a reminder that the simplicity of the straw bale concept, needs to be coupled with very careful engineering and design to avoid disappointing structural failures. Oh! and by the way, wouldn't the tall wheats that we are growing make many more per acre, and much stronger, straw bales than the modern short stemmed wheat varieties?

If you are generally fascinated by straw and its uses then the following book is worth reading: *Cereal Straw* by AR Staniforth, Clarendon Press, Oxford, 1979; it is in the library at the University of California, in Davis.

WHOLE GRAIN NUTRITION
Folic acid and all that it can do

Folic acid, has been gaining in notoriety during the last few years. It's part of the complex of B-vitamins and because folic acid was originally isolated from the leaves of spinach, most people expect to eat their quota of it with their salad and cooked leafy greens; the name even suggests this. But wheat germ is also a rich source of folic acid and so the following was written for the *San Francisco Baking Institute*'s newsletter, Spring 2002:

Whole grains to live with, or white flour to die for?

It used to be that a high cholesterol level in the blood was the indicator for increased heart disease risk. Now there is a relatively newly recognized compound, homocysteine, that does more than reveal susceptibility to heart disease, when it is high. Alzheimer's disease, adult onset diabetes, and abdominal obesity have also been correlated with higher than normal homocysteine levels in the blood, so revealing that the cause

of these diseases is related. What's more, homocysteine levels in the blood can easily be lowered. The seed foods eaten in the whole form, such as whole grain wheat, barley, rye and oats, beans, nuts, sesame and flax, have an abundance of nutrients that have been shown to reduce the risk of these diseases. In a recent study, when a combination of these seed foods was eaten in place of refined grain foods, homocysteine levels were distinctly reduced. A lot of American tax money has funded studies discovering that we would be better off health-wise, if we ate our grain foods in the whole grain form, but in this case it was Korean tax money that funded the studies. It is not only in the USA that refined foods are wreaking havoc with our health; it is in every country where the most basic grain foods are prepared predominantly without the germ, and outermost bran and vitamin rich layers.
Bakers have an important role to play, and that is to create interesting and healthful baked goods from whole grain flours, indeed it is a real responsibility. In the past this responsibility has been ducked by adding back to the refined flour a few of the nutrients present in germ and bran, that are removed during the refinement. The B-vitamin deficiency diseases beriberi and pellagra became rampant after refined flours became the normal part of the diet, to such an extent that it was necessary to mandate the addition of the B-vitamins thiamin and niacin, and other nutrients back into the refined flour, from the 1940's onwards. That was 60 years after roller-milled refined flour came within reach of almost everybody in the Western world. Recently, after another 60 years, folic acid has been recognized as a nutrient that will reduce the incidence of spina bifida births, and the decision has been made to add it back to refined flour. Folic acid will also lower homocysteine levels, and folic acid deficiencies have been correlated with Alzheimer's disease. Folic acid is concentrated in the germ and bran of the whole wheat grain, and is enough to supply at least half the recommended daily amount if all grain foods are eaten in the whole grain form. Usually when folic acid is added back to refined flour, it is in a much larger amount than would naturally be present in the whole grain.
Very worrying is the current fashion by millers, to sell refined organic flour without additives. This is carried to an extreme point. Most, if not all refined organic flours are being sold without added vitamins and minerals, on the assumption that it is the responsibility of the baker to add them. The answer of course is to learn how to make pleasing 100% whole grain baked goods. It must be possible to produce truly delicious whole grain products, without the use of the deficient ingredients that are the basis of modern refined product baking. People were pleased before the 1880's, for millennia, with baked goods made from the whole grain. It's very hard for modern consumers, as well as modern millers and bakers, to grasp that such an ubiquitous product as refined flour, could be so harmful. Millers and bakers owe allegiance to their customers' good health, not to an arbitrary aesthetic or fashionable look to their products. Millers and bakers are actually in a perfect position to create a new fashion in whole grain products. Imagine the industrial growth as a result of doing exactly that!

MEANDERINGS

Babies, Mothers Milk and Wheat

Wheat is such a basic food in the world, that it is hard to comprehend that some people cannot tolerate wheat, nor even rye, barley or oats. This intolerance is known as celiac disease, or gluten intolerance, and is manifested as damage to the mucosal layers of the

intestines, so that absorption of necessary nutrients is impaired. The cure is to strictly avoid eating any wheat, rye, barley or oats. So it was interesting to read about some observations made in Sweden where celiac disease suddenly became epidemic some years ago, among children under 2 years old, and just as suddenly declined in incidence. The decline coincided with a fashion to introduce wheat foods to babies at a later age than 5-6 months, and in smaller amounts. But the key observation seems to have been that babies who were still being fed mother's milk at the time that they first ate wheat foods, were unlikely to develop celiac disease. If the babies continued to be fed mother's milk while they gradually ate more and more wheat foods, their risk for the disease decreased even further. This was described in the May, 2002, issue of the American Journal of Clinical Nutrition.

True celiac disease is relatively rare. So I tend to think that the people who say that they cannot eat wheat, but who nevertheless can eat spelt and Kamut, which are wheat varieties, as well as oats, barley, and rye without problems, as suffering from some other syndrome even if elimination problems seem to mimic true celiac disease. Perhaps the reason is that wheat is the most effectively refined of all the grains; almost invariably being eaten without accompanying germ or bran. None of the other grains: spelt, Kamut, oats, barley and rye are eaten in such a refined form. At least a portion of the bran and germ usually remains in the foods made from these grains. People eating unrefined grain products are likely to have good elimination, because of the accompanying bran and germ.

Dietary fiber is a very broad term and includes bran from grains, as well as pectin from fruits, and the many other types of fiber in legumes, nuts, seeds and vegetables. In a study performed more than 20 years ago, Gene Spiller found that we need a basic amount of fiber, 35-40grams total per day for good elimination, and that this needs to include a high proportion of bran type fiber. Some people react to too little fiber with alternating diarrhea and constipation, which might seem to be due to celiac disease, and these people would be the ones most evidently troubled by a low fiber diet and likely to look for a solution, while others are plainly constipated and take laxatives. The fact is, that unless all the grain foods are eaten with their accompanying bran it is almost impossible to have enough bran fiber in the diet to promote a healthy elimination. Transit time for our food should be 1-2 days only. Can you believe that for some people that time is as much as two weeks? Exercise can only do so much to flatten the tummy!

Acrylamide in foods - an opinion

Everything's happening in Sweden for some reason. A recent study in Sweden revealed that acrylamide, a known carcinogen, is substantially present in many foods. A new assay method prompted the search, and those who were seeking, did indeed find acrylamide in a wide range of carbohydrate foods. But wait! Might there be some other common factor than that acrylamide was mostly found in carbohydrate foods? Various brands of French fries had just as varied amounts of the offending acrylamide, the range was 300 to 1100, in units of micrograms per kilogram. Even more striking was the range for breakfast cereals, from less than 30 to 1400 units, and in crisp breads from less than 30 to 1900 units.

When the simple carbohydrate foods, potato, rice, pasta and flour, were boiled, no acrylamide was formed. So it would seem strongly suspicious that the fats

present together with the carbohydrate food, are the cause of the acrylamide formation. The Swedish study did not address the varying fat types or quantity in the tested samples, but anxious observers have suggested that these fats should indeed be described in detail for all the foods investigated. Now for my personal opinion. The most likely fats to have a link to the production of acrylamide in the processed carbohydrate foods, are the hydrogenated fats, and here's my reasoning:

Hydrogenated fats are very widely used in carbohydrate foods. The hydrogenation process is used to change the texture of cheaply produced cotton and soybean seed oils, to fats for any application from frying, to shortening baked goods. The process of hydrogenation is a major chemical transformation that involves a powerful metal catalyst. To date the emphasis has been on noticing how the process turned unsaturated fats into saturated fats. But already one adverse alternative reaction in the hydrogenation process has been noticed, and that is a rearrangement of the unsaturated fatty acid components to form trans-fatty acids. Perhaps another adverse reaction during the hydrogenation process, is the formation of acrolein from the glycerol component of the fat. Then the acrolein might be converted all the way to acrylamide in the presence of potato and grain proteins, when the fat is fried or baked.

All this simply strengthens my conviction that hydrogenated fats are best avoided altogether. Instead we can learn to use the healthier organic oils and fats from olives, and tree nuts, and carefully produced organic butter, all in moderation, as well as using the whole seeds of sesame and flax....

ABOUT WHEAT

Red versus White, and Hard versus Soft Wheat

Before the Prairies were opened up in the late 1800's, California was a bread basket state, growing enough for its own use as well as exporting to Europe, England in particular. The wheat varieties grown were predominantly beardless and white grained. White being a general description for a light colored bran that almost matched the color of the flour. Some varieties were introduced by the Spanish missionaries in the 1700's and others were imports from Australia and Chile at the time of the Gold Rush. Farmers in California saw the need, and opportunity, to grow wheat for the suddenly populous state from 1850 onwards. The zenith for wheat in California was from 1860 until 1880, when they grew their wheat on huge farms of 20-30,000 acres. Much of the necessary power for equipment was provided by teams of mules or horses. Fertilization was supplied by the horses, mules and flocks of grazing sheep. This wheat was not irrigated. By 1900 California was growing only about the same amount as it is now in 2002, as a result of the competition from the Prairies, beginning in the 1880's.

The summers inland in California and in most of the Pacific States are dry, and only the winters are rainy. These are the conditions conducive to the white branned wheats. White wheats in general are the softest, although where the summers are also very hot then some varieties will become quite hard. Hardness is simply a description of texture, and is easily judged by chewing a few wheat berries. The initial bite into a hard wheat is exactly that, hard. Until recently white wheats that were also

hard were not acknowledged as a class of wheat for trading.

Fortunately the red-branned wheat varieties can stand up to rain and humidity during the summer, in general, without succumbing to fungal disease. Perhaps even more important, the red-branned wheats do not begin to sprout while waiting to be harvested, after summer rain. Such attributes are valuable throughout the Prairies, in the Ukraine, and in the other areas in Eastern Europe and Russia from where the Prairie wheats came. These regions have a continental climate characterized by extremes of heat in summer and cold in winter, as well as precipitation spread throughout the year. In these regions the wheat grown is red-branned, fairly high in protein, usually 12% or more, and hard in texture. This hard red wheat has the best reputation for bread making, by modern standards. Hard red wheat is produced in vast amounts in the Prairies and supplies almost all of the needs for bakers of bread in the Western world. When its production in the Prairies was established by the 1880's, and the method for refining to modern white flour perfected, then the use of white-branned wheats was no longer of importance. As a result of refining, a light colored flour could be produced even from a dark red-branned wheat; no need any more for a white branned wheat for a light colored flour. Besides, the new refined flour was whiter than any that had ever been seen before. Hence the demise of white wheat production for bread, in quantity, in California or indeed anywhere.

Soft red wheat is produced in areas where the summers are somewhat rainy but not so hot as in the Prairies. Currently, the soft wheats, red and white branned, are generally used for making cakes, cookies, crackers and short pastry, rather than bread. They are often grown under conditions that bring the protein down to a very low level. For example in California most of the white wheat now grown is irrigated and grown to maturity before the hottest part of the summer, and the protein is often only about 9%.

More than 120 years have elapsed since refined Prairie wheat, hard and red, overwhelmed the marketplace, but concerns about this monopoly have at last surfaced. Whole grains have been recognized as very important for good health, so that discarding the red bran for aesthetic effect is now seen by many as foolish. So in Kansas wheat breeders have turned their attention to producing a hard white-branned wheat that can withstand the heat and humidity of the Prairie summer. Similarly in Montana they have bred hard white wheat varieties. But in California and other regions with a Mediterranean climate of warm wet winters and hot dry summers, many of the white -branned wheats could be classified as hard, and have a similar texture to the "new" white Prairie wheats. To develop fully the hard characteristics of white wheat varieties in California, it is necessary to grow them with only the natural rainfall, and to choose varieties that will head up as the summer heat and dryness begin, assuming that the soil has been optimized for minerals and nitrogen. Yields for hard white wheat grown under these conditions will be less than with irrigation, but such wheat will be very desirable, and should fetch a higher price for the farmer.

EQUIPMENT

More about Mills

Meadows Mills, in North Carolina, now offers an alternative to the magnetic shoe at the base of the hopper. They offer a shoe that has no pockets that would trap

grain. This is a valuable alternative to the magnetic shoe because this trapped grain was impossible to remove, and was eventually attacked by insects and so contaminated the flour. Apparently the magnetic shoe is necessary when the grain is imperfectly cleaned and could carry metal pieces that would be forced between the millstones. The ideal in any case for milling whole grain flour, is to use thoroughly cleaned grain, so the presence of the magnet should be quite unnecessary. For information, ask Bob Hege, telephone: 800-626-2282.

Bob's Red Mill, in Oregon, is best known for its line of organically produced grain products sold in health food stores and health conscious supermarkets. Their experience in stone milling many of their products is very impressive. Recently they have taken an interest in the Danish Mills made by Skiold for their own milling, and now import them and prepare them for use in American bakeries. The stones are set horizontally and are made from quartz particles embedded in a man-made stone product. Even so these stones need to be dressed or sharpened approximately every 18 months, like all millstones. A table top model may also soon be available. For information, ask Dennis Vaughn, telephone: 503-654-3215

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Photo ready copy can be submitted, or we can design a simple ad. for you from your information. Prices will be $20.00 for a quarter page, $10.00 for an eighth page, and $5.00 for a sixteenth page-size advertisement.

Newsletter
Written contributions from members, are encouraged, in the form of short articles (under 1000 words), and letters to the editor (under 300 words).

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