**The Whole Grain Connection Newsletter**

**October 2022**

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| ***A formula for local whole grain hubs***  So, we’ve realized that the commodity grain system aims for refined flour and centralized milling and storage of refined flour. We’ve seen that this system cannot accommodate the need for a supply of fresh whole grain flour for everyone! We’ve also seen that the conventional agricultural system associated with commodity grain does not build soil or mitigate climate warming. The commodity wheat system is currently supplying a paltry 5-6% of their total output as whole wheat flour, thus making a mockery of the *Dietary Guidelines for Americans* that at least half (50%) of our grain foods should be whole grain for good health.    In Trumansburg, New York, one farmer has formed an exemplary partnership locally to produce organic whole wheat flour [**www.farmergroundflour.com**](https://r20.rs6.net/tn.jsp?f=0017TA0ogme9T6ot1XDgBe4aKPB2WGxX91S2pqEcxMG48NIF-diP1V3NtYAdF2rcRjFJcuIPiZEIpbGycJYn2-H_Oz-T9Yh5Gs3hk2xtLsmcfk7cU8pR8TEUlFW5zUwtpjrpUK5OBh-QyDGB_FP0LxZEsW3WTseeN4R&c=pt61E9m4y_yvnshqlfWRMmj5cCQy8ZPz0MYkiMdCuyAYdKYSbLdgKg==&ch=QjQv65v95zsQnutD4U4lq3IANoJUKnhxNKDdw51t_vf9XcO9HooTPQ==)  Here’s a video of their milling operation. Grain cleaning also happens here:  [**https://www.youtube.com/watch?v=Aa3Hoy2JLlE**](https://r20.rs6.net/tn.jsp?f=0017TA0ogme9T6ot1XDgBe4aKPB2WGxX91S2pqEcxMG48NIF-diP1V3NtYAdF2rcRjFm1Je3uHgW5FaXpekCvVkdtU8A-TdEQelen_J_t5VI82dGleICmparU7gv5f7Rf8d-u2lFwVeAjtOQQYyyE7gnjBHUKW4kVKJvjwZeAz0QGFgF2b8CTthAQ==&c=pt61E9m4y_yvnshqlfWRMmj5cCQy8ZPz0MYkiMdCuyAYdKYSbLdgKg==&ch=QjQv65v95zsQnutD4U4lq3IANoJUKnhxNKDdw51t_vf9XcO9HooTPQ==)  The change I would make, would be to produce only whole grain flours. There is no sense in competing with commodity refined flour, even if it is sifted (bolted) to a higher extraction rate of 85% in comparison with the 75% extraction for refined flour. White wheat and durum give light colored whole grain flours and can satisfy the aesthetic need to make light colored 100% whole grain baked goods.  Our alternative system in California, with freshly milled organic whole grain flour as the end-product is regional. Potentially, there would be many millers and bakers interspersed throughout the urban community. Proportionately fewer local millers and bakers would serve the rural populations. Ideally, the source for grain would be from California farmers growing organic grain but would likely be largely supplemented with organic grain from out of state. *There’s not enough wheat grown in California for our large California population.*Each miller would be storing enough grain for their immediate needs plus perhaps a year’s supply in reserve.  The ideal of using California grown organic grain in California whole grain bakeries is where the most effort will be required. This extra effort is mainly due to the need for grain to be cleaned after combine harvesting. Such grain cleaning facilities are few and far between in California; they generally serve only the largest of grain growers in the state.  Grain cleaning involves large equipment that needs to be housed to keep away rodents, birds, and creatures in general. The facility needs to be kept dust free, clean and at a cool temperature. The floor space needs to be sufficient to accommodate forklift maneuvering of pallets of grain and flour. Basic grain cleaning requires a ***Clipper type machine***that has a series of shaking sieves and a fan to blow off the fine dust. Organic agriculture often means that there is at least some weed seed to be removed. For example, an ***indent separator***may be needed to remove wild oat seeds and a ***spiral cleaner***to remove round vetch seeds.  However, the most valuable equipment after the basic cleaner is the ***gravity table***that sorts the grain and weed seed according to density. It therefore not only allows separation and removal of weed seeds but enables the largest grain to be separated from smaller and broken grains. Also, given the interest in the hulled wheat types: einkorn, emmer and spelt, the inclusion of efficient ***de-hulling equipment***is essential.  Milling at scale locally to whole grain flour requires plenty of space also. This is described in two You Tube slide presentations:  [***Part I. History of California wheat & milling, nature of wheat grain, mill types***](https://r20.rs6.net/tn.jsp?f=0017TA0ogme9T6ot1XDgBe4aKPB2WGxX91S2pqEcxMG48NIF-diP1V3NtYAdF2rcRjFCDRpAeXADSJGQK7cDAB_gXr_vwr72KrSOOtjh8k_IjPx0SUd-LbXbAmjdVGUm2DTquxAvsf-NiR8oOAhz3a5XQ==&c=pt61E9m4y_yvnshqlfWRMmj5cCQy8ZPz0MYkiMdCuyAYdKYSbLdgKg==&ch=QjQv65v95zsQnutD4U4lq3IANoJUKnhxNKDdw51t_vf9XcO9HooTPQ==)  [***Part II. Whole wheat flour mill systems & marketing considerations***](https://r20.rs6.net/tn.jsp?f=0017TA0ogme9T6ot1XDgBe4aKPB2WGxX91S2pqEcxMG48NIF-diP1V3NtYAdF2rcRjFjwUAKB6qSWIQXqXz6B_4kV3k7K8YFUQcxPBRmJKDWT-v3vQ0ngu8MxC4BcTMObtMEoT1s-j4dFxMKZtvF1YW4Q==&c=pt61E9m4y_yvnshqlfWRMmj5cCQy8ZPz0MYkiMdCuyAYdKYSbLdgKg==&ch=QjQv65v95zsQnutD4U4lq3IANoJUKnhxNKDdw51t_vf9XcO9HooTPQ==)  Setting up either a mill or grain cleaning facility can be with a view to serving a region or just one farm or bakery. A farm with enough land to spare for regional facilities would be ideal. Grain cleaning and milling need not be together on the same land, although this would certainly make for increased efficiency.  Thus, the business partners needed would be a farmer with land for facilities, a miller, a grain handler and at least one committed baker supporting the quality control for the entire process. Engineers will be invaluable for setting up and running all of these facilities. Other business structures can be envisaged, including a non-profit service mill and grain cleaning. The mill illustrated by [**Farmer Ground Flour**](https://r20.rs6.net/tn.jsp?f=0017TA0ogme9T6ot1XDgBe4aKPB2WGxX91S2pqEcxMG48NIF-diP1V3NtYAdF2rcRjFJcuIPiZEIpbGycJYn2-H_Oz-T9Yh5Gs3hk2xtLsmcfk7cU8pR8TEUlFW5zUwtpjrpUK5OBh-QyDGB_FP0LxZEsW3WTseeN4R&c=pt61E9m4y_yvnshqlfWRMmj5cCQy8ZPz0MYkiMdCuyAYdKYSbLdgKg==&ch=QjQv65v95zsQnutD4U4lq3IANoJUKnhxNKDdw51t_vf9XcO9HooTPQ==)is demonstrably successful. The market is wide open for schools and everyone! |

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***Fifty years on! Where are the 100% whole grain foods?***

Whole grains protect against type-2 diabetes. and similarly against diabetes during pregnancy. So, it was shocking to see that diabetes during pregnancy had risen steeply during the covid pandemic, and especially in California.

Grateful I am to have been able to discuss this with the Editor of *Milling & Baking News*, Josh Sosland. On August 9, 2022, his editorial addressed the whole grain dilemma facing the commodity wheat stakeholders' w*hole wheat flour market woes.*

The complaint now by the commodity grain stakeholders is that sales of whole grain breads are falling. *I'd say this is so, because they make compromised products with reconstituted whole grain flour that is not fresh, leaven it inappropriately with a sugar-yeast system or with baking powder / baking soda, and in general have failed to give us the opportunity to experience naturally leavened 100% whole organic grain breads made with freshly ground flour, produced in a single pass.*

The real reason we have such a hard time finding truly 100% wheat breads and pasta is therefore because the supply is just not there. There has been no reciprocating government intervention to match the *Dietary Guidelines for Americans*recommendation that we eat at least half our grain foods in the whole grain form, and preferably all. By coincidence today I read that the way in which electric and non-polluting vehicles are to be introduced into California will be to issue a fine to those auto makers who do not comply with producing 68% electric or non-polluting vehicles by 2030, and 100% by 2035. This is likely to be a successful plan. There has been no similar government attempt to ensure the provision of 100% organic whole grain foods in amounts to match the population needs.

The first warning that refined flour was inadequate as a basic food came with the discovery by the 1940s of the vitamins and minerals that would prevent the then prevalent deadly extreme deficiency diseases: beri beri and pellagra. These vitamins and minerals exist primarily in the bran and germ of grain. It is the bran and germ that is absent from refined flour. The so-called *enrichment* of refined flour with some of these vitamins and minerals was at first mandated, but later was mostly voluntary. Eventually in the 1990s artisan organic refined flour was not even enriched in this way, so making it comparable with the deficient flour prevailing in the early 1900s.

In the 1970s astute physicians, including Denis Burkitt and colleagues, saw that beyond doubt dietary fiber in the bran from grains, provided protection against another group of deficiency diseases: obesity, type-2 diabetes, cardiovascular disease, colon cancer and more. Their message was heard loud and clear in the scientific community but repeatedly ignored by the commodity refined flour industry for the next 50 years. That dismissal continues to this day in 2022, while we experience the alarming rise in obesity and type-2 diabetes.

The well-known concept of *whole foods* has developed primarily from this recognition that we need to be eating all the whole grain parts together: bran, germ, and endosperm to be healthy. People therefore do not expect to be so short-changed by the producers of basic flour, yet they have recognized many times over that there is something wrong. Refined carbohydrates in general, have been blamed for the rise in obesity by modern physician Robert C. Atkins in his popular book *New Diet Revolution.* Wheat itself has been similarly blamed by another modern physician William Davis in his book *Wheat Belly.* By now in 2022, there are significant numbers of people who have an aversion to wheat, most likely because it is still predominantly presented as refined flour. In response, wheat products are being replaced by the entrepreneurial production of gluten free (wheat free) products. This is why there has been such a relentless reduction in the per capita consumption of refined wheat flour.

It is high time that the commodity refined flour millers wake up to the fact that their refined flour is nutritionally deficient, as are the basic grains rice and corn, when presented in the polished and degermed forms. Spelt, emmer, einkorn and Kamut® (Khorasan) are types of wheat that have avoided this reputation, mainly because they are presented in the whole grain form and only occasionally as a refined flour.

The poor and the poorly educated, have no means to access whole grain foods outside the commodity system in the way that people with means can. The result is an enormous loss in productivity and high cost of treatment for chronic disease, especially obesity and type-2 diabetes, among the poor.

***Why is there such apathy for whole grain foods?***

It seems to be obvious that people would recognize that we need to be eating whole grains as our most basic food. Yet there is no clamor for whole grains! Why not?

I believe this is primarily because 100% whole grain foods are just not available in sufficient quantity. Flavoring bread with whole grains even at 50% likely has little obvious effect on the two personal experiences that people really notice: improved laxation and ideal weight maintenance. Pasta is rarely made from 100% whole durum wheat; rice is presented mainly as polished rice and corn as refined corn flour.

Wheat and rye bran are the most potent in their effects as dietary fiber, but we also need the mix of dietary fiber type from fruits, vegetables, other whole grains, legumes, nuts, and seed foods in general. The total fiber intake together with its associated nutrients, needs to be at least up to a certain threshold value before the personal experiences are felt and protection from disease begins to take effect. This usually means that very little refined carbohydrates would be eaten, except by the most energetic and active. Even then, we need to have eaten more than that threshold amount of grain dietary fiber for at least two weeks before laxation and regularity are noticed, and it can take perhaps 6 months before realizing that there was no need to be worrying about putting on weight when eating all bread and pasta in the whole grain form. Additionally, when replacing refined flour products with whole grain products the microbiome needs to adjust and the immediate effect might be uncomfortable gassing and a generally upset digestive system. All this hardly encourages change to eating 100% whole grains in place of the status quo of refined grain foods. The knowledge that it’s worth persevering with truly whole grain foods for the health benefits to be experienced, must be presented loud and clear. Whole grain products need to be made more interesting.

The current recommendation for 25-30 grams dietary fiber including 4-9 grams fiber from 48 - 96 grams whole grains per day, for most adults, may be just threshold amounts that we need and scarcely feel make any difference. Most people are eating much less dietary fiber and whole grains even than these amounts each day, so have almost no feeling of the benefits to their health.

There are efforts in the *National Academy of Science and Medicine* to recognize something like this threshold value for dietary fiber. They talk about *Chronic Disease Risk Reduction*intakes (CDRR intakes). But it seems that CDRR intake (a threshold value) has yet to be discussed either for dietary fiber, and or particularly for whole grains.

All this knowledge gained in the last 50 years, seems doomed to stay in scientific circles, unless there is government intervention, or a concerted philanthropic effort to educate everyone: farmer, miller, baker, and consumer that the need for truly whole grain foods is urgent and that it is worth making a concerted effort to create the supply. At the same time, we need subsidies for those entrepreneurs who want to be part of the supply chain for truly 100% whole grain foods.

***The Ancient Mediterranean Diet***

The ancient Mediterranean diet based on wheat and barley, served all the major ancient Mediterranean and Middle Eastern civilizations: Egyptian, Persian, Greek, and Roman. It’s hardly surprising that it is still among the most successful diets that we have for good health and longevity. The caveat is that the flour from wheat in ancient times was left whole for most people’s bread. Flour sifted free of the largest chunks of grain, and therefore finely ground contained all parts of the grain.  Besides, it was not until the late 1700s that truly effective sifters (bolters) were invented that could remove primarily bran and germ to produce an 85% extraction flour. The total refinement of flours to 75% extraction, so that they contain absolutely no bran or germ was not perfected until about 1880. Hence the late discoveries that the vitamins in the bran and germ are indeed vital to our health by the 1940s, and in the 1970s that to avoid obesity and chronic disease we need to eat the dietary fiber and other nutrients in the bran and germ of grains.