Make it a Malt

Malts are generating new culinary experiences from flavor to function.

FOOD CREATORS seeking a simple or clean label for their product can find help from a natural ingredient discovered in ancient times. Malt has been associated with the production of beer for at least 6-9,000 years. It is widely thought that ancient farmers in Egypt or Mesopotamia stumbled upon the art of brewing when bread, water and heat unintentionally combined and fermentation was initiated.

The Egyptians liked the result of this impromptu brew and eventually discovered that “prepping” raw barley for brewing by sprouting, germinating and drying it made more and better beer. The art of malting was born. Fast forward to today, when the rapidly expanding American craft beer industry is shining the spotlight on malt.

Malt is known to brewers as the “soul” of beer. Yet for years, the oldest grain process in the world had been given short shrift in the culinary world. Today, however, malt is finding its way into many more formulations than beer, generating new gastronomic experiences through its functionality, flavor and appearance.

Malting is a three-step process that develops or produces natural enzymes inside the kernel using only two ingredients—raw cereal grain (usually barley) and water. The process begins when the grain is soaked in water for two days until sufficient moisture is absorbed and the grain begins to sprout.

Next germination continues for four days during which enzymes continue to be developed and produced. Gentle kiln-drying then stops germination and preserves the enzymes, producing what is termed “diastatic” malt.

Drying the wet germinated grain or kiln-dried malt at higher temperatures and longer periods of time (either in the kiln or in a roaster) creates rich colors and pleasing flavors, while destroying all of the active enzymes. This produces “nondiastatic” malt.

By varying moisture along with drying times and temperatures during the malting process, experienced “maltsters” are capable of producing a colorful array of malts, from pale gold to deep chocolate browns. Flavors run the gamut of malty to biscuity, caramel to sourdough, raisiny to cocoa. In addition, malt can be further processed into natural sweeteners—malt extracts that are characterized by the same colors...
and flavors of the standard and specialty malts from which they are processed. Malt sweeteners deliver the added benefit of being among the most nutritious sweeteners available to the food industry, making them an excellent alternative sweetener in many formulation categories.

Malt is a blanket term often used to loosely describe one of several different classes of malt ingredients. Each class delivers varying levels of flavor, color, texture and function to baked goods and other foods and beverages, and is characterized by the unique functions it performs.

**Malty Goodness**

For food and beverage developers seeking a malt ingredient solution to address a functional, flavor or color challenge, once the functions of the specific food or beverage application at each stage of the production process is defined, the appropriate malt ingredient can be determined.

The first consideration for formulating is the basic class of malt or malt extract, that is, diastatic or nondiastatic, and standard or specialty. Then, textural attributes can be applied, via a variety of available forms, such as whole kernel, particulate or flour. Malt extract can be incorporated in either liquid or powder form.

Malt is a key ingredient in baking formulations. It has dough conditioning properties that can be attained in place of less natural or more costly ingredients and, when developing products relying on malt’s functional attributes, research chefs and their teams can take advantage of a comprehensive range of specialty malts and malt extracts in ranges of color and flavor. These ingredients, originally produced for American craft beer, offer new and innovative formulating options.

Although malt’s value as a natural dough conditioner was not widely recognized in the past, it is catching on. Moreover, the other organoleptic attributes it brings to a baked product has led it to be used at much higher rates for function as well as unique natural colors and flavors.

Light-colored standard and specialty diastatic malts at 0.5%-3% are excellent for basic dough conditioning in a yeast-risen dough. Taking the amount up to 5% suits pretzels and crackers. In other bakery formulations, especially chocolate-flavored items, medium- to dark-colored specialty nondiastatic malts can be used to create desired textures and colors, along with flavor enhancement.

For example, using 15% specialty nondiastatic malt in compound chocolate and cookies lend a desired richness that accents the tastes and colors without overpowering them. These malts can be used at levels of up to 25% in cooked puddings, pie fillings, cakes and brownies, and up to 35% in dark chocolate semisweet cakes, fudge-type brownies and devil’s food cake items.

Where deep browns and dark sweet or toasted richness are needed, nondiastatic malt at up to 50% can bring the necessary depth of color and flavor to pumpernickel items, dark rye breads, black sandwich-style cookies, ice cream sandwich wafers, ice cream sandwich wafers and dark chocolate cookies. Liquid and semiliquid formulations such as sauces and gravies can also benefit, for example, through incorporating 10%-15% nondiastatic malt.

Diastatic malt is another excellent, natural dough conditioner, contributing a cocktail of natural enzymes—primarily alpha-amylase—that are beneficial to yeast-risen doughs. It not only softens the dough, it shortens fermentation and proofing time, improves machinability and extensibility, and enhances crumb and browning of crust.

Standard malted barley flour, milled from standard diastatic malt, is widely used by millers and bread manufacturers at 0.5%-1.0% to “standardize” the falling number of all-purpose and

The same flavorful malts and malt extracts used in pale ales, red lagers, nut-brown ales, stouts, porters and other craft beers make effective multifunctional ingredients for food creations.
bread flours, and without impacting flavor or color. In between are specialty diastatic malt flour options that naturally condition the dough while adding color and flavor, yet have lower enzyme levels, so usage rates can increase up to 3% or higher. At this amount, they still will condition the dough and also flavor and color the finished bread. These malt flours have been dried at slightly higher temperatures for longer periods of time during the malting process.

Malting raw rye “tames” the intense spicy rye flavor characteristic of the raw grain, and the resulting malt flavor is especially appealing in baked goods. As a result, rye malt offers unique contributions as a multifunctional, natural dough conditioner. Malted rye has a sweet, slightly tangy rye flavor. It also develops a dough to be softer and have more elasticity. This allows for higher volumes and shorter proof times.

Malt and malt extracts are excellent tools for natural color adjustment in baked and culinary formulations. They help attain clean and simple labels. Malt extracts, however, differ from malts in how they function as natural colorants. Malt that is milled into flour functions as a pigment. Pigments are insoluble colored compounds that color by dispersion. As they are individual particles, they are not infinitely dilutable. Dilute solutions can show specking.

Malt extracts function as a dye, that is, they exhibit their color power when diluted in a solvent. (These are sometimes referred to as “washes.”) In general, they are infinitely dilutable. Deciding whether to color with malt flour or malt extract also depends upon the finished product and target color. Color adjustment plus flavor and functionality can be achieved by formulating with less intensely roasted caramel and chocolate malt flours and malt extracts. Intensely roasted black malted barley flour and black malt extract deliver color with no flavor when used in small amounts.

For balancing color in liquid formulations, these extracts can be used in amounts as small as 1% for coffee, tea and soups; 5% for sauces (such as barbecue sauce) and 10% for gravies. In solid formulations, dark breads, cook-
Bakers desiring to give breads a more artisan touch can also find solutions in specialty nondiastatic malts and malt extracts. As an example, in the gourmet pizza category, developing a crust that’s as good as the toppings and/or more nutritious is a frequent goal. Whole-grain crusts are growing in popularity, but present challenges due to their intense flavor. But specialty malted barley flour effectively masks the whole-grain sharpness, while adding color to give the crust an artisan appearance. Best of all, malted barley flour is itself a natural, whole-grain flour. Then substituting malt extract a natural, nutritious sweetener for sugar aids fermentation and browning.

Malts are extremely versatile, multifunctional ingredients that can help product developers solve function, color and flavor challenges yet are label friendly for health-conscious consumers. In addition to simple and clean labeling advantages, processors will benefit from using malt ingredients that are 100% pure grain, non-GMO ingredients made from only grain and water. Malts are low in fat, high in fiber, a good source of protein, and impart less starch than plain barley flour. They also are rich in B-vitamins including thiamin, riboflavin and niacin.

Malted flours make excellent bitterness maskers in baked whole-grain products.