

Blending for value

Vital part of milling process enables millers to deliver consistent quality products to their customers

by Mark Fowler

Whether for wheat or flour, product blending is a vital part of the milling process that enables millers to deliver consistent quality products to their customers. But the blending objective must be defined to enable the miller to make the best blending decisions.

The most common blending objective is usually the result of the need to balance quality and consistency while minimizing raw material cost, known as “the least cost blend.” Another option for millers is to provide unique, high quality, consistent products to the customer at a premium. Whichever decision is made, the miller must blend to deliver the best balance of cost and quality. This is referred to as “blending for value.”

Reasons for blending wheat and/or flour in the flour milling process can be categorized into three areas:

- to deliver a consistent product;
- to develop a unique product; and
- to minimize raw material cost.

WHY BLEND?

Consistency. The miller and baker each have reasons to value a consistent product. Delivering a uniform blend of wheat to the mill is vital to maximizing yield and mill efficiencies. Variations in the moisture, protein and density of wheat delivered to the mill can negatively affect mill balance and result in lower extraction rates and lower flour output. But most importantly, if the wheat is not consistent in protein and other quality characteristics going into the milling process, then the flour will most likely not have consistent quality characteristics desired by the mill’s customers. Delivering a homogeneous mix of wheat to the mill is crucial in delivering flour with repeatable quality characteristics.

Uniqueness. The ability to differentiate your product from the competition is important in marketing it to customers. Whether you’re blending similar classes of wheat with different protein levels or blending dissimilar classes of wheat for unique end-product characteristics, both are strategies to



develop distinctive products from a rather common raw material. Soft wheat, spring wheat and hard winter wheat all have their own quality characteristics that can be blended to create unique products, providing more value for both the miller and his customer. It’s important to maintain an inventory of wheat from various classes to allow the miller flexibility to produce

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MILLING OPERATIONS

the types and quality of flour available in the market.

Cost Control. The most common reason to blend is cost control. This involves blending wheat to meet the minimum quality requirements of the customers at the least possible wheat cost. This usually means blending the maximum amount of low-cost wheat into a higher-valued mix or blending a minimal amount of high-cost wheat into a low-cost mix. With regard to both blending options, the question must be asked: "Does the least-cost option deliver the best value to your customer?" Blending for minimum cost without considering the quality of the finished product may risk the consistency of the flour delivered over time. Changing the types of wheat used in the blend may change the functional properties of the flour. When deciding what wheat to use in the mill blend, it is important to not only deliver a consistent quality of flour day to day, but consider the availability of different wheat options throughout the year.

The decision of what to blend is difficult, but deciding when and how to blend products can be even more complicated. Is it better to blend the various wheat choices before it is milled, or is it preferred to mill the different wheat

choices separately and blend the various flour types? The key to answering this question is evaluating the capability of each milling facility to discover which strategy can be delivered consistently and what capital requirements would be necessary to upgrade for the different strategies.

WHEAT BLENDING REQUIREMENTS

The key requirement to wheat blending is knowledge. While managing the wheat supply to the mill, the manager must have good knowledge of the wheat inventory and available supply, knowledge of the mill and elevator capabilities, knowledge of the market and of the customers.

There are several options and opportunities to blend wheat. If the mill has a good relationship with a wheat supplier, it may be possible to have special blends of wheat made at the shipping elevator, before it is delivered to the milling facility. The wheat should be blended from at least two different storage bins before it is delivered to the mill cleaning system to improve consistency.

The next opportunity to blend wheat is after cleaning before conditioning, and the final and most critical time to blend wheat is after tempering just prior

to milling. The stage at which wheat is blended depends on the systems at each facility, but the wheat should be blended at least three or four times before it is milled to maximize the consistency of the wheat to the mill.

FLOUR BLENDING

The primary purpose for flour blending instead of wheat blending is product customization. This is achieved by blending the standard flour from different wheat mixes to create unique flour quality or characteristics. Another option for creating unique flours is selecting and binning separately individual streams from similar or dissimilar wheat mixes.

Another purpose for flour blending is product consistency. This is especially essential when the majority of the flour is used by one customer. This homogenization occurs during long milling runs of a similar wheat mix and is important when wheat blending for uniformity is not possible or ineffective.

FLOUR BLENDING REQUIREMENTS

As with wheat, the key to successful flour blending is knowledge. Having knowledge of each flour type and its functional characteristics, knowledge of your mill and flour system capabilities,



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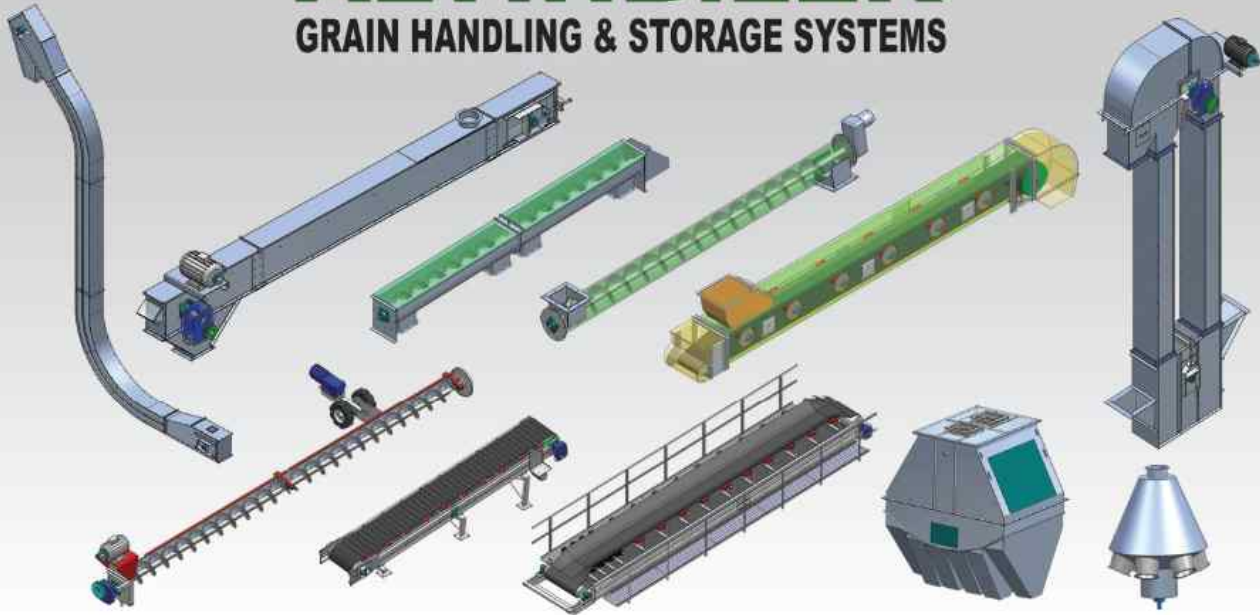
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knowledge of your market, and knowledge of your customer is absolutely necessary to make the right decisions. There are also several strategies to improve the flour blending capabilities in the mill.

The best and least used tool in blending flour is known as the “stream analysis.” Some custom flours can only be produced by stream selection. The stream analysis will reveal which streams to select and the expected extraction rate, an important cost and pricing factor. A mill stream analysis will reveal the quality and quantity of the “leftover” flour not selected. It is also appropriate to use the mill stream analysis for each different wheat that is milled normally, for different milling locations, and if the wheat quality is updated for crop year changes.

Continuous blending following milling is another blending strategy. For this strategy, each flour bin has a variable speed discharger and flow rate adjustment. The dischargers empty into a continuous blender or transfer system. The accuracy of flour blend depends on the accuracy of bin dischargers and the absence of flour bin chokes.

Batch blending following milling requires a large-capacity blender on a high-capacity scale. Each flour type used is weighed into the blender, and there is generally good accuracy. Batch blending is a very good technique for relatively small quantities of flour, such as specialty packaged products. Batch blending is a relatively slow process compared to continuous blending.

Re-blending the blended flour is the final blending strategy that is widely used in the milling process. Some mills will re-blend flours from the beginning of the run with flours from the end of the run. This helps to homogenize the flour. This technique, which requires extra power and bin space, is most appropriate for long “runs” of the same blend and is necessary to reclaim the flour produced by the mill during the short transition time from blend to blend.

Blending strategies depend on the capability of the laboratory where the flour

is tested. The laboratory must know exact qualities of the flour available for blending and must supply the miller with the blending ratios. It is usually a mistake to try to blend more than two or three flours.

MINOR INGREDIENTS

The addition of minor ingredients in blending is important. The laboratory must supply the miller with the specifications for minor ingredients based on baking tests. These minor ingredient requirements can vary from one crop year to the next or if constituent flours are from different wheat.

Where to add the minor ingredients is another question for the miller to ask. Should you add them immediately after milling and before blending, during blending or both? Some mills may need to add ingredients at the milling stage. Some blends may have a different response to additives than the responses of the constituents. Adding additives at the milling stage means you will need to make more “slightly” different constituent flours and thus need more flour silos to keep them separate.

Adding additives during the blending stage is normally desirable since it reduces the silo requirements by allowing the mill to produce untreated flour. But when flour is produced straight from the mill, it is not economical to pass the flour through a blending system only for addition of minor ingredients. Thus many mills are equipped to add minor ingredients at either processing stage.

So what is the best blending philosophy? Blend as often as is economically possible for maximum consistency. Blend wheat for uniformity and maximum mill performance. Blend flour for consistency and product customization. **WG**

Mark Fowler is the associate director of the Kansas State University Department of Grain Science and Industry’s International Grains Program. He can be reached at mfowler@ksu.edu.

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