Biscuit Production Line: Transforming Local Resources into Wealth

This past March, a client from Ghana reached out to us with a unique vision. He wanted to venture into biscuit production, but with a distinct twist: his primary raw ingredient wasn't standard wheat flour—it was bananas.

Ghana is renowned as a major banana-producing region; however, fresh bananas are notoriously difficult to store. When massive harvests ripen simultaneously, any unsold fruit is frequently left to rot in the fields, leading to significant waste for local farmers. The client’s brilliant idea was to transform these surplus bananas into shelf-stable biscuits—a strategy that would not only drastically extend their shelf life but also generate substantially higher added value.

The Technical Challenge

Yet, a major technical challenge quickly arose: bananas possess a high natural moisture content and are incredibly rich in sugar. Because of these specific properties, it is virtually impossible to shape and bake them directly using a standard, off-the-shelf biscuit production line. Keen to find a way forward, the client asked us: *"Can you help me design a viable solution?"*

Rather than rushing to offer a generic "yes," we took a more consultative approach and first asked him three critical questions to properly gauge his needs:

1. What are the specific varieties and ripeness levels of the bananas available in your region?

2. What is your target daily production output?

3. Do you prefer the finished biscuits to have a hard, crisp texture or a soft, crumbly one?

Once he provided his detailed answers, we engineered and presented a fully customized, three-part solution: **a static drying chamber, a specialized pulverizer, and an adapted biscuit production line**.

The Three-Step Solution

- **Step 1: Dehydration & Drying** Before processing, the bananas had to be thoroughly dehydrated. We designed a custom static drying chamber for him that utilizes advanced hot-air circulation technology, keeping the temperature precisely controlled between 60°C and 70°C. This precise thermal process efficiently extracts moisture without compromising the bananas' natural aroma, vibrant color, or nutritional value. Through this step, the moisture content of the banana slices drops drastically from 80% down to approximately 12%, resulting in golden-hued slices with a deeply concentrated sweetness.

- **Step 2: Precision Pulverizing** Next, the dried banana slices are fed into a high-efficiency, specialized pulverizer. For this stage, we selected a robust design featuring a stainless steel cutter disc paired with an adaptable sieve structure. This setup allows the operator to easily swap out sieves with different mesh sizes to achieve the exact fineness required for the recipe. Because the client wanted a banana powder as fine and smooth as traditional wheat flour, we equipped the machine with a specialized 80-mesh sieve.

- **Step 3: Biscuit Production & Baking** The resulting fine banana powder is then used to replace a portion of the standard wheat flour. Combined with necessary auxiliary ingredients such as sugar, oil, and eggs, the formulated dough is finally ready to enter

the core biscuit production line. To ensure a perfect bake, we specifically adjusted both the recipe ratios and the commercial oven's temperature profile. This adjustment was crucial because banana powder has a significantly higher water absorption rate than wheat flour, making the dough highly prone to scorching if exposed to excessive or uneven heat.

Building Trust Through Transparency

Even after the technical solution was finalized, the client understandably harbored some lingering hesitation: *"I've never seen a production line configured like this before; could I see it via video?"*

To put his mind at ease, we immediately arranged a live video conference call, virtually "walking" him through our manufacturing workshop. We showcased every engineering detail in real-time—ranging from the precise thickness of the insulation panels in the drying room and the strategic positioning of the air circulation fans, to the heavy-duty blade material of the pulverizer and the intuitive method for replacing the sieves.

During the tour, he also observed the banana powder samples currently undergoing quality testing. Watching our technician rub a pinch of the powder between their fingers, he could see it was as fine and velvety as flour. On the other end of the video call, the client fell silent for a few seconds, taking in the scale and quality of the operation, before finally smiling and saying, *"You guys are truly professional."*

Engineering Impact

True customization is never merely about selling off-the-shelf machinery. Rather, it entails virtually stepping into the client’s local fields, understanding the unique characteristics of their raw materials, and actively resolving the unspoken operational challenges they face.

By bridging the gap between raw agricultural output and advanced food processing technology, tailored engineering turns local challenges into global opportunities. Behind every customized banana biscuit production line we build lies a tangible story of a farmer’s increased income—and the ultimate starting point for a visionary entrepreneur transforming local resources into sustainable wealth.