



Bean processing time reduced by 90% with new innovative method

MIXING & BLENDING, PREPARED FOOD

Processing beans is time consuming, with the raw material requiring soaking for as long as 12 hours before it can be heated, ground and mixed. And each step takes place in a separate machine. But a revolutionary new process reduces this processing time to just 15 minutes – and is carried out in a single piece of equipment.

The traditional method for processing peas and beans into [paste products](#) like refried beans and hummus consists of several steps, each of which is usually carried out in a separate, dedicated piece of equipment: washing, soaking for several hours, heating, grinding, and finally mixing.

However, a new innovative process achieves the same result but in a single mixer, reducing the total time by up to 90% compared to any known commercial process. The whole installation is much simpler, no time is wasted for transporting the beans from machine to machine, and less cleaning is needed.

This groundbreaking idea to process dried peas or beans direct in the heating step had never been tried until a trial in 2016 at Tetra Pak Scanima in Aalborg, Denmark. The process worked surprising well in a 100-litre batch, taking just 15 minutes to reduce hard beans to a smooth mash. A patent is now pending for the unique process.

Just add water

“We don’t have a time-consuming soaking phase that can take two to 12 hours,” says Hans Henrik Mortensen, Manager of the Centre of Expertise at Tetra Pak Scanima. “We take the washed beans, put them in our mixer and add a little water. Then we start grinding them down and heating them up at the same time. By combining the cooking and grinding steps, we save time. Cooking beans that have been ground into particles is much faster than cooking whole beans and this also saves time. What’s more, we can do all these steps in one machine.”

The peas or beans are disintegrated into approximately 1mm pieces by rotary blades while being heated. Then while the small pieces are cooking, toxic lectin-type substances present in unsoaked beans are removed. Lab tests show that the finished paste is free from these toxins and the results are comparable to the traditional process, where soaked beans are used*.

The same concept, with no need for soaking, could be used in the making of hummus direct from dried chickpeas. There is also great potential in the making of peanut butter from dried peanuts. The mixer used in the process can be fitted with some unique circulation features that make it possible to handle a viscous product like peanut butter or bean paste without any problem.

Concept: proven

Proof-of-concept tests have been carried out using a Tetra Pak High Shear Mixer equipped with a dynamic stator system, a jacket heating system and a direct steam injection system. All process steps except washing were carried out in the mixer. Among the successful tests have been:

- Making hummus from chickpeas
- Making refried beans from black beans
- Making refried beans from fava beans (broad beans)
- Making peanut butter from peanuts

After the 2016 demonstration and further trials, a customer involved in the Danish trials was so impressed that they ordered a 5,000-tonne Tetra Pak High Shear Mixer for their factory in Guatemala.

* Industrial regulations in the USA and Europe still stipulate that the soaking of beans must take place for refried beans, so this new process is not allowed in these areas unless the regulations change. Nevertheless, the main markets for refried beans are Latin America and the Middle East where these restrictions do not apply. Please contact us for more insights on bean processing with mixers.

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