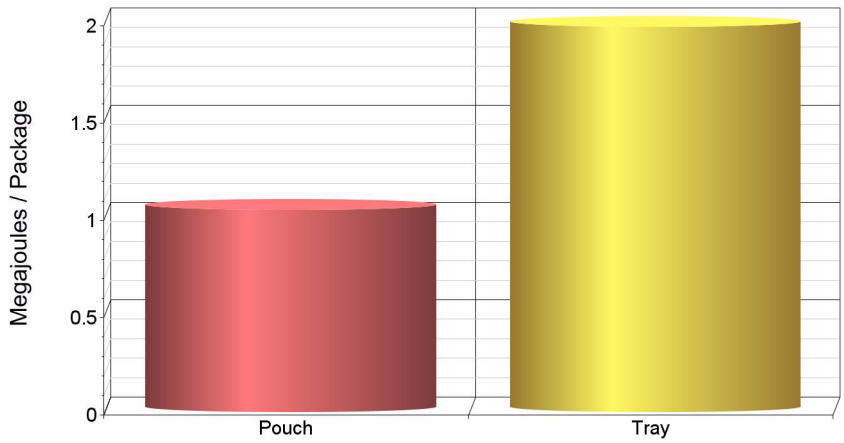
2. Environmental impact

The environmental analysis for this study included a complete cradle-to-grave life cycle analysis for each package type. Figure 3 provides the energy consumption results of the life cycle analysis.

Figure 3

Energy Consumption

(megajoules per filled package)



Source: Allied Development Corp.

The pouch was lower and more favorable in energy consumption (Figure 3). The most important reason for the difference in energy consumption is the energy consumed while manufacturing the packages. All of the energy required to manufacture the raw materials used to manufacture the packages was accumulated and accounted for as part of the package manufacturing energy. The pouch had the best energy metrics due to its efficient use of raw materials.

case of the pouch versus the can, the pouch has a thinner profile and a much shorter distance for the heat to travel. The thin profile and added surface area of the pouch reduces the sterilization time.

However, a metal container can be agitated during sterilization without damage to the package, which can sometimes reduce the cycle time. However, agitation doesn't work for every product. Some products are so viscous that they don't sufficiently move around inside the can when it is agitated. Creamed corn is an example of a product where the sterilization time is not reduced significantly with agitation. Some products, such as green beans, are too fragile to be agitated and fall apart if they are agitated during retorting. For green beans that can't be agitated, retort times can be reduced by as much as 40% when using a pouch.

Figure 15 compares of kidney beans retorted in can (top left) and kidney beans retorted in a retort pouch (top right). The improvement in texture is very evident. Pinto beans (bottom) also show improvement.

Figure 15

Kidney and Pinto Beans Packaged in Cans vs. Retort Pouches

Source: Jyoti Natural Foods, USA.

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Ownership	Public
Annual Sales	US$786 million
Contract Packaging Sales	US$13 million
Retort Pouch Product Sales	US$2.6 million
Product Brandnames	None
End-use Market	Food

Source: Company financial data and Allied Development estimates

Company

Riken Vitamin Co. Ltd. (Riken) was incorporated in 1949 and is headquartered in Tokyo, Japan. The company has eight branch offices, five factories, and seventeen subsidiaries. Riken employs 3,121 people. Since its beginnings, Riken has grown and expanded its business into four main industries:

- consumer and commercial foods, with a focus on wakame seaweed and dressings
- processed food ingredients
- food chemicals for industrial use