

Evaluating Tradeoffs Case Studies

▶ **BOVINE SOMATOTROPIN USE IN DAIRY COWS**

Bovine somatotropin (BST) is a hormone produced by a cow that tells its body to produce milk. Recombinant Bovine Somatotropin (rBST) is a synthetic hormone that is biologically equivalent to BST, meaning the cow's body treats and processes it the same as BST. Milk from cows given rBST has the same amount of nutrients and calories and the same level of hormones while cows receiving rBST produce about one more gallon of milk daily. Concerns about potential or perceived effects on human and animal health have led some groups to call for companies to source only milk from cows not administered rBST. FDA has determined that rBST was proven safe for humans who consume the milk and meat from animals treated with it, and also that rBST did not cause adverse effects on the health and well-being of the treated cows.

But what are the tradeoffs in deciding to reject use of rBST? Due to less milk produced per cow, producing the same amount of milk without rBST results in a larger carbon footprint, more water used, more land required and increased greenhouse gas emissions, which are in conflict with the most common environmental sustainability goals. It also results in less affordable milk, cheese and yogurt products as well as lower income for dairy farmers, which is in opposition to many social sustainability objectives.

So how do you balance the perceived public health concerns or absence label marketing claims with negative impacts on environmental and social sustainability goals? Improving animal welfare, including of animals receiving rBST, as a sustainability priority can address this concern. Communicating the shared values of safe, nutritious food and factual information supporting the safety of rBST will acknowledge concerns while supporting placing a higher priority on the sustainability benefits of its use.

▶ **CAGE-FREE EGGS**

Let's look at another example tied to housing laying hens. In conventional systems, hens are housed in barns in multi-level rows of cages. In cage-free systems, hens can move within sections of a barn with perches, nesting boxes and floors covered with a natural material.

A multi-year study showed the hens in cage-free systems were able to better express natural behaviors such as pecking and scratching, had better leg strength and improved feather condition, attributes highly valued by some stakeholders. The same study showed the cage-free system had higher mortality and increased cannibalism/aggression (more than twice as many hens died prematurely), increased greenhouse gas emissions (double the ammonia emissions), poorer air quality for workers (particulate matter levels sometimes 8-to-10 times higher) and higher consumer egg prices (cost of production 36% higher).

► SLOWER GROWING CHICKENS (BROILERS)

“Slower growing,” as defined by the Global Animal Partnership, is equal to or less than 50 grams of weight gained per chicken per day averaged over the growth cycle, compared to current industry average for all birds of approximately 61 grams per day. This means that in order to reach the same market weight, the birds would need to stay on the farm significantly longer. A study by the National Chicken Council detailed the environmental, economic and sustainability implications of raising slower growing chickens, revealing a sharp increase in chicken prices and the use of environmental resources – including water, air, fuel and land.

If only one-third of broiler chicken producers switched to a slower growing breed, nearly 1.5 billion more birds would be needed annually to produce the same amount of meat currently produced – requiring a tremendous increase in water, land and fuel consumption:

- Additional feed needed: Enough to fill 670,000 additional tractor trailers on the road per year, using millions more gallons of fuel annually.
- Additional land needed: The additional land needed to grow the feed (corn and soybeans) would be 7.6 million acres/year, or roughly the size of the state of Maryland.
- Additional manure output: Slower growing chickens will also stay on the farm longer, producing 28.5 billion additional pounds of manure annually. That’s enough litter to create a pile on a football field that is 27 times higher than a typical NFL stadium.
- Additional water needed: 1 billion additional gallons of water per year for the chickens to drink (excluding additional irrigation water that would be required to grow the additional feed).

If the industry did not produce the additional 1.5 billion birds to meet current demand, the supply of chicken would significantly reduce to 27.5 billion less chicken meals per year. The additional cost of even 1/3 of the industry switching to slower growing birds would be \$9 billion, which could have a notable financial impact on the cost of chicken for foodservice companies, retailers, restaurants and ultimately – consumers. This would increase food instability for those who can least afford to absorb increases in food prices.

More research is needed to better understand if raising chickens slower than they are today would advance progress on health and welfare. Research will help identify if there are additional, unforeseen consequences of raising birds longer.