

Got greenhouse gas?

Focusing efforts on productivity is a better approach than digesters.

by Jude Capper

ALTHOUGH agriculture contributes less than 6 percent of total U.S. greenhouse gases (GHGs), the pressure is on livestock producers to reduce GHG emissions. To this end, USDA and the Innovation Center for U.S. Dairy recently signed an agreement to reduce dairy GHG emissions by 25 percent by the year 2020.

So how do dairy producers cut their GHG emissions? According to the press release that accompanied the announcement, the answer is methane digesters. That sounds like a simple solution, but is it? Only 2 percent of U.S. dairy farms currently use methane digesters; this agreement aims to increase that number considerably. However, there are various sound reasons why this technology has not been widely adopted already.

Firstly and most importantly, digesters are not a size-neutral technology. Their installation and maintenance requires a huge capital investment that is not economically feasible for small farms. At present it is suggested that digesters may only generate sufficient income to be fiscally prudent on farms having more than 300 cows. Therein lies a big problem.

In 2008, 81 percent of U.S. dairy farms were estimated to have less than 100 cows, and 97 percent to have less than 500 cows. These figures strongly indicate that digester technology will have to move very rapidly and become much more affordable before it can be adopted by a significant number of farms. Keeping a digester running correctly also appears to be an art that few have mastered so far.

Although digesters do reduce methane emissions from manure, emissions of other pollutants such as nitrous oxide and nitrogen oxide may also increase to unacceptable levels in areas that already don't meet federal air quality standards, such as California's central valley.

It is essential to remember that methane from manure is only one component of total dairy GHG emissions. These also include methane and carbon dioxide from cows themselves, nitrous oxide from fertilizer and manure application, and carbon dioxide from fuel combustion. Even if methane digesters were installed on every single U.S. dairy farm and they all worked at optimal efficiency, this would still fall short of the dairy industry's goal of reducing total GHG emissions by 25 percent.


Instead of relying on a single magic bullet to provide the solution to greenhouse gases, we need to take a wider view of the entire dairy production system.

Improvements in productivity over the past century have allowed us to reduce GHG emissions by 63 percent per gallon of milk. This amazing achievement has been made possible by advances in nutrition, genetics and management, allowing more milk to be produced using fewer resources (feed, cropland, fertilizer, fossil fuels) and with a far lower environmental impact.

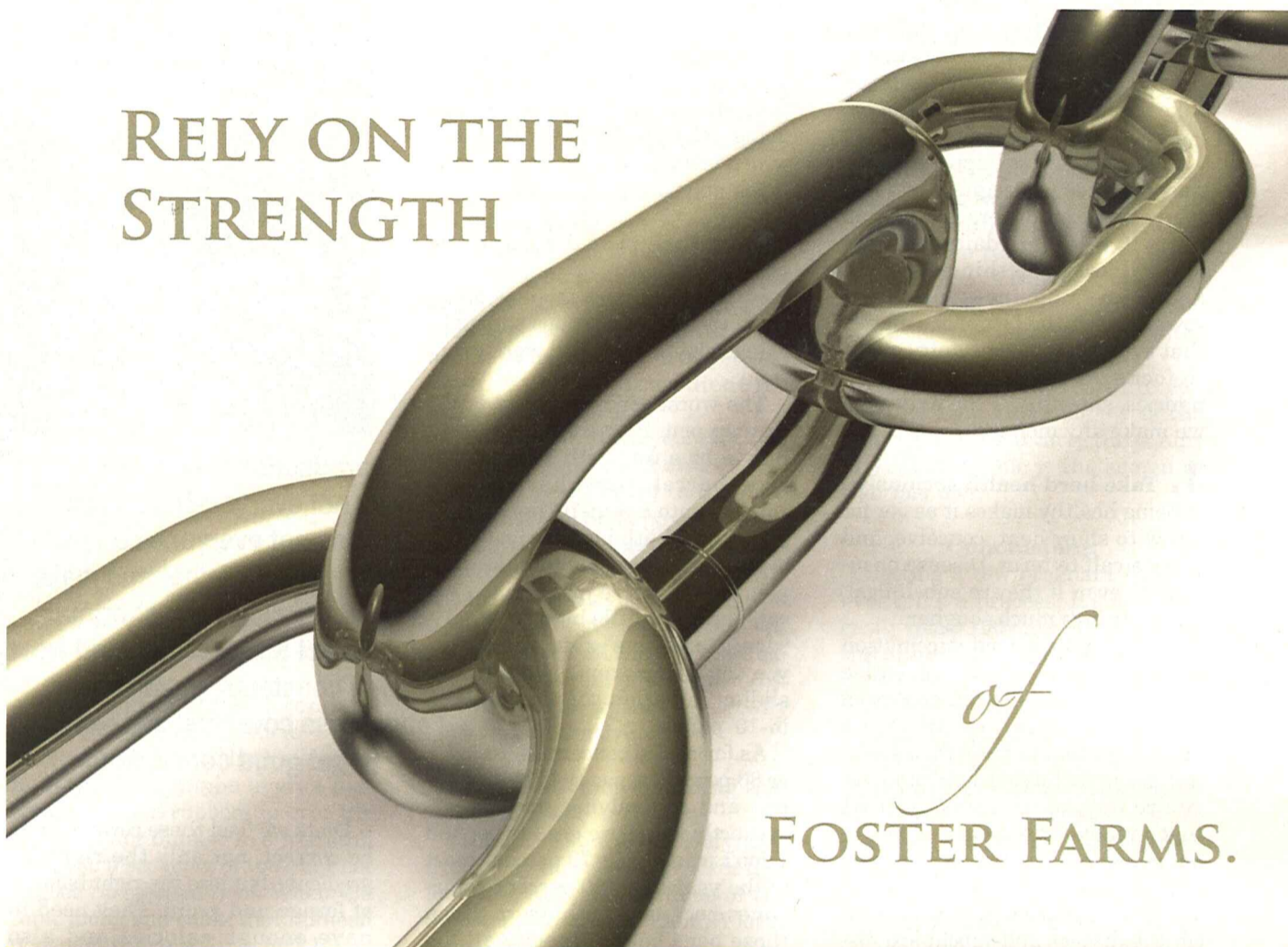
We have significant potential to make further productivity improvements. For example, increasing milk yield by 10 pounds per cow per day with no other management changes reduces GHG emissions per gallon of milk by 8 percent.

Increasing milk yield per cow has the biggest impact on GHG emissions from dairies, but concurrently improving other elements of productivity (pregnancy rate, heifer growth rate, and incidence of health problems) will also reduce environmental impact and improve both animal welfare and economic viability. We can reduce GHG emis-

sions still further by increasing crop yields, targeting fertilizer application, and adopting more efficient cropping technologies.

Improving all facets of on-farm productivity allows us to fulfill the three components of dairy sustainability: economic viability, reducing environmental impact, and social acceptability. If we take major steps to improve productivity it should easily be possible to reduce dairy GHG emissions 25 percent by 2020. Unfortunately, promotion of one single, economically unfavorable technology as the ultimate solution will not achieve this aim. 

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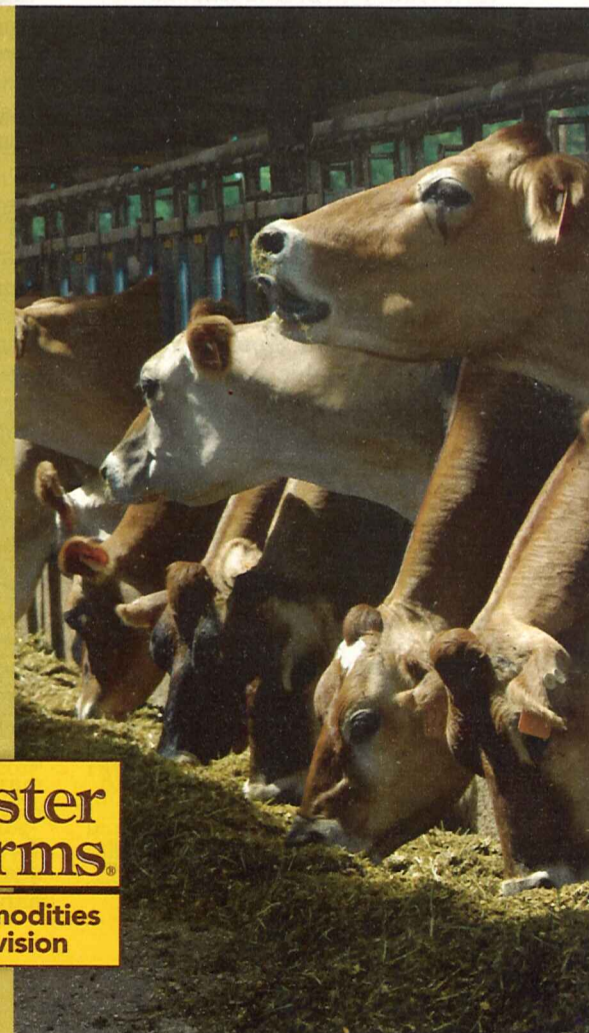
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