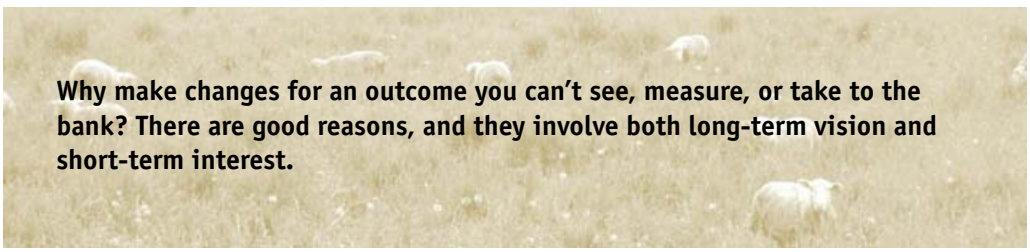
INTRODUCTION

The more we learn about greenhouse gas and climate change, the more we, as energy consumers, understand that each of us can help reduce emissions.

The same is true for economic sectors. Power generation, manufacturing, transportation, and agriculture all contribute to the problem. With mounting public concern and research, these sectors acknowledge they have both a duty and an opportunity to tackle emission levels.



Why make changes for an outcome you can't see, measure, or take to the bank? There are good reasons, and they involve both long-term vision and short-term interest.

Agriculture appears well-positioned to make a difference. Properly managed, healthy soils may act as a "sink" to remove greenhouse gases from the atmosphere. Natural areas found on many farm properties, such as wetlands, woodlots, pastures and buffers, can also trap gases. Opportunities for on-farm green energy generation look promising. Studies are continuing to identify and quantify emission reduction measures.

In the meantime, as a farmer you can begin addressing a problem of planetary proportions in your day-to-day operations. The good news is that the practices that will help reverse global warming are accepted best management practices for productivity and sustainability. Here are some of the benefits.

Production efficiency. The best management practices that reduce emissions in fact do double-duty, promoting feed efficiency, reducing waste and saving you dollars.

Energy conservation, production and co-generation. While it's early days, with continual technological advancements, there is potential for harnessing energy.

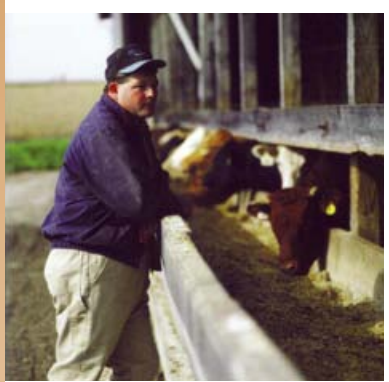
The good news is that many practices that will help you achieve your goals, such as improved productivity, greater nutrition use efficiencies, and reduced impacts on water resources, also reduce greenhouse gas emissions.

Using anaerobic digestion technology, liquid manure can be processed to generate biogas for energy and to reduce methane emissions.

Future protection of animal agriculture. Climate change will eventually affect management decisions involving housing and energy systems, breed selection, preventative health measures, and drinking water systems. Although the agricultural season could be lengthened, crops could be threatened by extreme climatic events and northward expansion of infectious agents.

Societal stewardship. Like planting trees, the actions you take to reduce greenhouse gas emissions on your farm will benefit your children and their children. It's an investment, and all of us have to start somewhere.

Public perception and due diligence. As animal feeding operations expand and become more geographically concentrated, we can expect an upsurge in public concern regarding air emissions. By adopting some reasonable measures, you and the livestock and poultry sectors at large can get in front of would-be critics targeting animal agriculture vis-à-vis global warming. Better that producers actively seek and make improvements that are greenhouse gas and farmer-friendly – before less suitable "solutions" are imposed by regulations or the marketplace.



Public perception suggests that large livestock operations are key sources of air and water pollution – irrespective of the fact that most large operations are resource-efficient.

"When's the best time to plant a tree? Thirty years ago." Significant greenhouse gas reduction is a long-term proposition, and the time to start is now.

There's also reason to take heart. In the past decade, giant strides have been made in many facets of farming – tillage, genetics and feeding, for example – all of which will help cut on-farm emissions. And more information is coming on board all the time, including accurate measurements of emissions from many species of livestock, and the means to reduce emissions.

Researchers continue to look for reductions in greenhouse gas emissions from livestock production systems. The most promising options are those practices that improve efficiency, lower costs and provide other environmental benefits, too.

RISKS

Because this is a relatively new area of study, there are some unknowns you should be aware of:

- some greenhouse gas BMPs need more on-farm verification
- the impacts of some greenhouse gas BMPs have not been sufficiently documented
- a few of the practices that may reduce greenhouse gas emissions might increase the risk of nitrate movement (e.g., plowdown legumes in rotation).

HOW THIS BOOK IS ORGANIZED

To get off to the right start, it's helpful to understand some basic principles related to greenhouse gas and livestock agriculture. These are covered in the next chapter. From there we'll take a bird's-eye view of production systems. Then we focus on a livestock production system, one component at a time.

Beginning on page 18, we'll look at greenhouse gas BMPs for key components such as breeding, feeding, housing, quality control, and nutrient management. We'll explore how to fine-tune these components to reduce emissions.

As you read through, keep in mind there are many excellent reference materials that explain in detail the general BMPs as they relate to crop production and nutrient management. At the back of the book, there's a list of references and links to more information.

Cattle produce methane, which is a greenhouse gas. Methane is also an indication of feed inefficiency. Rations can now be fine-tuned to reduce methane and waste in feed.