

CONSIDERATIONS FOR DEVELOPING NON-GMO DAIRY RATIONS

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INTRODUCTION

A number of dairy food processing companies are developing and marketing non-GMO products. Thus, they are enlisting dairy herds to adjust their feeding programs to use non-GMO forages and feeds. This shift in providing non-GMO dairy products is based on meeting demands of consumers. Many of these dairy food processing companies acknowledge that there are no differences in the safety of foods produced using GMO technology. A review paper evaluated the impact of GE (genetically engineered crops fed to animals (Van Eenennaam and Young, 2014). They reported finding no trends in livestock health and productivity that could be related to feeding GE derived crops. This same study also indicated that there were no differences in the nutritional profiles of products from animals fed GE rations. A publication from the National Academy of Science concluded that there was no substantial scientific evidence that foods from GE crops were any less safe when compared to foods from non-GE crops (NAS, 2017).

MILK PRODUCTION

Ferraretto and Shaver (2015) used a meta-analysis approach to examine potential differences between GMO hybrids and their non-GMO isogenic hybrids. This study included 48 research papers and 162 treatment means. There were 21 treatment means for the isogenic hybrids and 13 treatment means for GMO hybrids. The authors concluded that forage nutrient composition and milk production was similar for both types of hybrids.

FEEDS AVAILABLE

The primary GMO crops grown in the U.S are corn, alfalfa, cotton, soybeans canola and sugar beets. A companion paper in these proceedings provides detail on the percent of the crop acres planted to GMO crops (Lawrence 2017). This same paper also identifies forage sources as either GMO or non-GMO (Lawrence, 2017).

However, there are also non-GMO seeds available for most of these crops. The following is a short list of non-GMO feeds available for use for use in dairy rations (Non-GMO Sourcebook, 2017). These feeds may be have limited availability.

- Corn grain, hominy feed, distiller's grain, corn gluten feed, corn gluten meal.
- Soybean meal, expeller soybean meal, soy hulls, roasted soybeans.
- Beet pulp.
- Canola meal, expeller canola meal.
- Alfalfa pellets.

Wheat, oats and barley should also qualify as non-GMO since no GMO varieties are grown in the U.S. The milling products from these grains should also be non-GMO.

RATION COMPOSITION

Rations for animals fed non-GMO feeds will be formulated using your current software and nutrient composition guidelines. The primary difference is that each forage and feed needs to be identified as either GMO or non-GMO. The percent of the total ration dry matter needs to be determined for each feed. Any feed added to the ration that comprises <5% of the total ration dry matter does not need to be non-GMO and is not evaluated in the auditing process (Heyman, 2017; Non-GMO Project, 2017). The inclusion level for these feeds must be verified both by formulation and actual batch feed mixing records. Ingredients such as animal protein sources, added fats and amino acids can be used as long as each is <5% of the total ration dry matter. Multiple feeds can be used if each added feed is <5% of the total ration dry matter. As an example, a ration could contain 4% soy hulls (GMO), 3% animal protein blend, 4% expeller soybean meal (GMO), 1.7% minerals and vitamins, 0.9% bypass fat and 0.1% amino acids. Total ration cost will increase since non-GMO feeds are priced higher than the same feed from a GMO source. These guidelines apply to rations fed to replacement heifers, dry cows and milking cows. These rations need to be fed for a minimum of 30 days before non-GMO certification could be obtained. Any ingredient that comprises >5% of the total ration dry matter must be non-GMO verified or tested.

RECORD KEEPING

One of the biggest changes in management of non-GMO rations is record keeping requirements. The actual records needed may vary some depending on the milk processor purchasing the milk. There may also be more specific guidelines provided by the third part auditing firms involved in the process.

1. Forage and feed purchase records. Information needed includes supplier, date of purchase, quantity purchased and storage location. This entails saving all invoices, receipts, feed tags, delivery weight slips or information on forage seed bags.
2. Verification – Letters are required from suppliers if they are providing a non-GMO certified product.
3. Forages – Track the hybrids or varieties purchased, field maps as to where the seed was planted, planting date, harvest date quantity harvested and storage location. Aerial maps of forage storage structures may help or be required.
4. Feed ingredients – Supplier purchased from, date of purchase, tons and storage location. The GMO or non-GMO status of each feed needs to be recorded.
5. Rations – All rations for replacement heifers, dry cows and milking cows must be included. The quantity of each feed in the ration and percent of the ration dry matter supplied by each ingredient. A record of the GMO or non-GMO status of each feed is needed. Data on animal numbers and milk production are needed.

6. Feeding management – Actual dry matter intakes are needed. This involves tracking the quantity of feed fed and adjusting for refusals. The simplest way to do this is to use one of the electronic feed management systems.
7. Test results – Copies of any tests done on individual feeds to confirm non-GMO status. There are on-farm tests available for corn, cotton, alfalfa and soybeans. A feed sampling and testing protocol needs to be developed.
8. Separation – GMO and non-GMO forages and feeds need to be stored separately to prevent any contamination.
9. Third party verification – Most processors are working with an outside firm to provide on-farm audits. The records listed above should provide the base information needed by the auditors. However, there may be additional records or information required by specific auditing firms.

SUMMARY

Developing rations for non-GMO herds uses the same principles and procedures that are currently used by nutritionists. There may be some limitations in ingredients available for use in non-GMO rations. Ration cost will usually be higher due the higher cost of non-GMO ingredients. The major change at the farm level is an increase in the type and quantity of the records that need to be kept on forages, feeds, rations formulated and rations fed. This may require development of an on-farm record keeping system to achieve this goal. Total costs for feeds and management time will increase and need to be compensated for by a premium pricing system for milk.

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