forage VIEWS

WEST-CENTRAL FORAGE ASSOCIATION

November 2018

In This Issue

Important Dates

Nov 29: Prairies North Farm Forum

Nov 30: Feed What You Need

HARVESTING AND USING HIGH MOISTURE GRAIN IN CATTLE RATIONS

OCTOBER 11, 2018 | BARRY YAREMCIO

Mother Nature has been uncooperative this fall. Rain, snow and low temperatures have all contributed to a frustrating harvest season. There are many acres of crop remain to be combined in parts of the province. If cattle are needing grain supplementation this winter, using high moisture barley is an option.

Harvesting the barley crop at 25% moisture or higher and storing it in a grain bag or silage pit will result in the barley fermenting no different than a whole plant cereal silage. To have a high quality, palatable finished product, packing the grain to exclude air (oxygen) is key. If putting the grain into a bag, the brake on the bagging unit needs to be engaged sufficiently so that the grain is well packed. When the bag is being filled, the height of the bag should be constant without "hills and valleys" which is caused by the machine rolling too far at one time. The amount of air in the bag is higher when the uneven height is present which can cause problems during fermentation. If filling a silage pit, pack the grain with a tractor no different than whole crop silage. Cover with plastic and seal the pit as within three to four hours if possible.

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HARVESTING AND USING HIGH MOISTURE GRAIN IN CATTLE RATIONS

CONTINUED

High moisture barley is beneficial to improve animal performance. Higher moisture barley kernels are swollen due to the moisture present. The pericarp or hull on the outside of the kernel is not held as tightly to the seed compared to when the grain is dry. Rumen microbes and bacteria have an easier time breaking down the kernel and digestive efficiency is increased, by 8 to 10%. Some research indicates this eliminates the need to roll or process the grain before feeding. Average daily gains for growing or finishing animals is also improved by approximately 8% as well. If the barley is to be rolled, do it before the barley goes into the bag or pit. Rolling higher moisture grain when it is frozen will result in the kernels shattering and the amounts of fines can be high. This could lead to digestive upsets when it is fed.

The higher digestive efficiency creates a few problems. With a more complete and rapid fermentation, the starch in the grain is more readily available which can produce digestive upsets such as acidosis or bloat. If high levels of grain are fed in a straw – grain ration for pregnant cows, increase the grain content gradually to prevent problems. If the ration starts off with approximately six pounds of grain per day, increase the grain portion one pound every second day. This allows the rumen bacteria to adjust to the change which prevents problems.

To determine if the changes being made to the ration are not causing subclinical acidosis, evaluate the consistency of the manure. With a healthy rumen that is functioning properly, the manure "pie" is fairly flat in structure. If the grain is causing acidotic conditions, the manure will become very wet and sloppy resulting in a "splatter" or "runny" consistency to the manure and it often has a "sour" smell. If this happens, reduce the amount of grain to allow the rumen to recover from the condition. Be sure to monitor the herd to ensure all the cows have access to the feed and the dominant cows aren't pushing the younger or weaker cows out, resulting in the boss cows eating too much grain which causes acidosis.

A factsheet is available from Alberta Agriculture on the storage of high moisture barley. https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex101/$file/114_61-1.pdf?OpenElement

With most grain – straw rations, calcium and magnesium are typically deficient and phosphorus is adequate. The use of a feedlot type mineral with roughly 20% calcium and 3 to 4 % magnesium is recommended to prevent downer cows or winter tetany. A 2 : 1 mineral will not supply sufficient amounts of calcium to the diet.

COW FEEDING ECONOMICS THIS WINTER

TED NIBOURG (FARM MANAGEMENT SPECIALIST AT AG-INFO CENTRE)

Rising feed costs during the second half of 2018 have many producers wondering about the economics of overwintering cows this fall. The question; is it even feasible to keep cows. Some are liquidating their entire herds, others are culling heavily and many are trying to find economical ways of maintaining their herds. The two main factors to consider in developing feeding economies are, of course, price and availability of feed. An additional factor to consider this winter will be the length of the feeding period. Our forage specialists are suggesting this feeding period could be extended by 30 days. The hot dry summer this year resulted in pastures being stressed to the point that it may take an additional 30 days next spring for the grass to recover enough to take normal grazing pressure.

I ran some rations through Cowbytes to arrive at daily feed costs to add perspective to feed price variations and the effect on a producer's bottom line. The rations assumed 1400 pound cows at mid pregnancy. The barley/straw ration priced barley at $5 per bushel and barley straw at $50 per ton. This resulted in a ration that came to $2.20 per head per day. With a straight grass hay ration for hay priced at 8 cents per pound the daily cost increased to $2.75 per head. Hay priced at 10 cents per pound jumped the daily cost to $3.40 per head and with hay at 12 cents per pound the daily cost bounced up to $4.10 per head.

I ran those numbers through Rancher's Return to give us some insight into the effect varying feed prices have on a producer's bottom line. I used a 100 head herd with a weaning percentage of 85%. It was assumed that 650 pound steer calves averaged $210 per cwt and 600 pound heifer calves averaged $190 per cwt. The feed costs for the barley/straw ration amounted to 53% of the total production costs for the herd and resulted in a gross margin of $13,250. A hay ration priced at 8 cents per pound increased feed costs to 58.5% of total production costs and reduced the gross margin to minus $250 basically break even. Hay at 10 cents per pound jumped feed costs to 63.5% of the total resulting in a negative $15,131 gross margin. Feed costs increased to 68% of total production costs for hay priced at 12 cents per pound resulting in a loss of $30,350.

Feed costs this winter are basically charges against next year's calf crop. Break evens in the fall of 2019 for this example herd on a barley/straw ration comes in at $176 per cwt for next year's calves. The herd on 8 cent per pound hay ration would need $202 per cwt to break even. At 10 cents per pound, break evens are $229 per cwt. Break evens for 12 cent per pound hay are $258 per cwt. This analysis underscores the necessity of managing feed costs for a cow/calf operator. Feed costs are by and far the largest component of the production costs in a cow/calf operation.

THIS IS A PRETTY GOOD HAY….! - PART 1

Often I get asked for help interpreting laboratory feed analysis. Once producers are convinced on the importance on doing testing, it is necessary to decide what nutrients need to be tested. Finally, once the results are back, how do you use them to improve the bottom line or get the most out of your beef feeding program? Too often producers only want to test their poorest feed to see if they can use it up in some way.

Some argue that best way to determine the feeding value of forage is to let the cows pick and choose what bales they eat! That usually results in over feeding and wastage. With proper feed testing and ration formulation you can minimize costs and keep up performance, avoiding costly nutrition related disorders. To be cost effective, you need to know quality and potential deficiencies before you feed!

WHAT NUTRIENTS SHOULD BE TESTED IN A FORAGE FOR BEEF CATTLE?

The most useful basic feed package includes: Dry matter (DM), Crude Protein (CP), Acid Detergent Fiber (ADF), Neutral Detergent Fiber (NDF) and macro minerals. Trace or micro minerals are important in the feeding program and are generally below requirements. Most nutritionists recommend supplementing to the full requirement for trace minerals, so testing is not really useful. Analysis packages from various labs can vary from $25 up to $50 dollars or more per sample depending on the test requested.

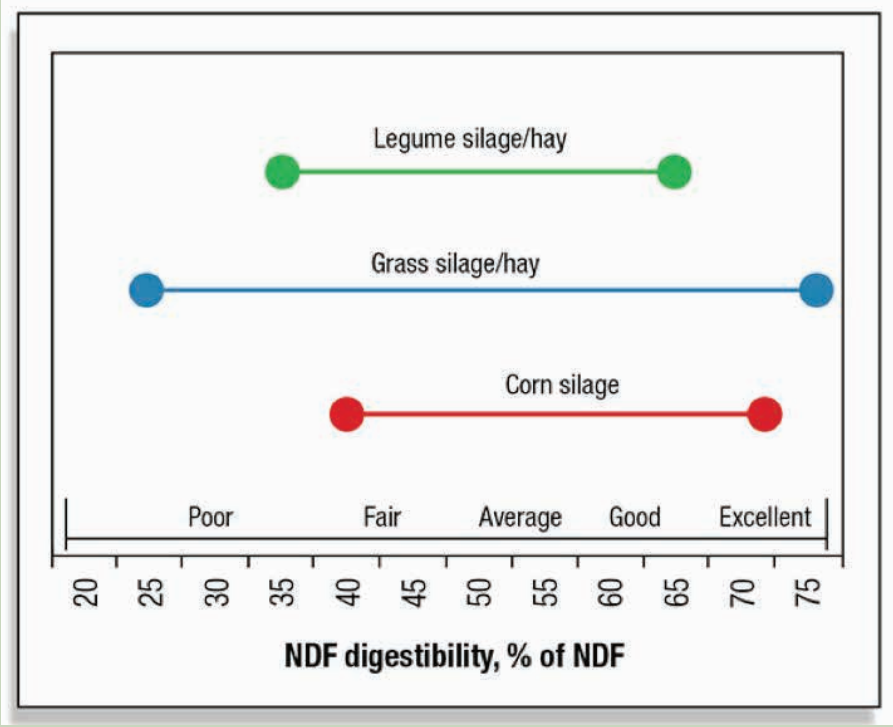
IMPORTANT PARAMETERS

The first thing you need to check is that the analysis belongs to you. Next, the sample ID, or sample field. Also, make sure that come January when the bales are covered with 2 feet snow, you know which test report corresponds to which bales. According to Amy Radunz, UW Extension Beef Cattle Extension Specialist (Hay analysis Guide for Beef Cattle) the most important results in a hay analysis report for beef cattle are:

1. Dry Matter (DM): Amount of moisture in the feed. This is important because nutrient requirements are based on DM.
2. Crude Protein (CP): For beef cows, the CP value is usually adequate to determine if the feed will meet requirements. If forage or feed has heat damage, the adjusted CP value subtracts the amount of heat damaged protein from gross CP, thus providing a better estimate of what is available to the animal.
3. Energy (TDN or NEm):
   - TDN (total digestible nutrients): This is the most common form of energy value reporting, but may overestimate the amount of energy available to the animal.
   - NEm (Net energy of maintenance): This is an alternate measure of the energy value. Others, such as Digestible Energy may also be reported.

I'm adding 3 more parameters to the list:

I. Neutral Detergent Fiber (NDF): Structural components of the plant, specifically the cell wall. NDF is a predictor of voluntary intake because it provides bulk or fill. In general, low NDF values are



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THIS IS A PRETTY GOOD HAY….! - PART 1 CONTINUED

desired because NDF increases as forages mature. As you can see from the graph below, NDF disgestibility varies considerably, so knowing the NDF level to start with is important.
* see chart on page 4

II. Acid Detergent Fiber (ADF): The least digestible plant components, including cellulose and lignin. ADF values are inversely related to digestibility, (the higher the ADF the lower the digestibility) so forages with low ADF concentrations are usually higher in energy.

III. Relative Feed Value (RFV): Buyers and sellers require an accurate and effective way of communicating the quality of hay using a method that best describes the feed value to livestock. RFV attempts to use a single value to describe forage quality, and has become a common tool for determining hay quality (intake and energy value) and in pricing hay.

Near Infrared Reflectance Spectroscopy "NIR" technology is an acceptable method of determining all of the above in conventional forages. Macro minerals: calcium, phosphorus, magnesium and sulphur are of primary concern. Potassium is often excessive which can be of concern. "Wet Chemistry" should be used to determine all mineral components.

Below is a typical feed test report with the important results underlined in green.

HOW TO INTERPRET THE RESULTS

Remember these rules of thumb when you trying to understand your next feed analysis. (Adapted from: AGRI-FACTS October 2004- Alberta Agriculture and Forestry - Agdex 420/52-4)

CRUDE PROTEIN

Protein is a building block. The Beef Cow Rule of Thumb with protein is 7-9-11, which means an average mature beef cow requires a ration with crude protein of:

- 7% - mid pregnancy
- 9% - late pregnancy
- 11% - after calving

ENERGY

Energy gives the ability to use the building blocks for growth and other productive purposes. Using Total Digestible Nutrients (TDN) per cent, the Rule of Thumb is 55-60-65. This rule says that for a mature beef cow to maintain her body condition score (BCS) through the winter, the ration must have a TDN energy reading of:

- 55% - mid pregnancy
- 60% - late pregnancy
- 65% - after calving

CALCIUM TO PHOSPHOROUS RATIO

The minimum requirements vary with the class of beef cattle, so using a ration formulation program is a useful way to ensure requirements are being met. Also, the calcium to phosphorous ratio (Ca:P) for beef cattle should be within the range of 2:1 to 7:1. Using the feed test result, the ratio

PARAMETER	RESULTS AS FED	RESULTS DRY	UNIT	METHOD
DRY MATTER				
Moisture	20.10	0.00	%	Wet Chemistry
Dry Matter	79.90	100.00	%	Calculation
PROTEIN				
Crude Protein	8.99	11.25	%	NIR
Soluble Crude Protein	36.06	36.06	% of CP	NIR
ADF-CP	1.37	1.72	%	NIR
NDF-CP	3.35	4.19	%	NIR
UIP (Bypass Protein)	37.29	37.29	Est % CP	NIR
FIBRES				
Acid Detergent Fibre	38.35	48.00	%	NIR
Neutral Detergent Fibre	49.71	62.22	%	NIR
Lignin	8.25	10.33	%	NIR
ENERGY				
Total Digestible Nutrients (Weiss)	40.47	50.65	%	Calculation
NE Lactation	0.92	1.15	MCal/Kg	Calculation
Net Energy Lactation (Weiss)	0.89	1.12	MCal/Kg	Calculation
NE Gain	0.38	0.48	MCal/Kg	Calculation
Net Energy Gain (Weiss)	0.38	0.47	MCal/Kg	Calculation
NE Maintenance	0.97	1.21	MCal/Kg	Calculation
Net Energy Maintenance (Weiss)	0.81	1.02	MCal/Kg	Calculation
MINERALS				
Calcium	0.46	0.57	%	Wet Chemistry *
Chloride	0.23	0.29	%	NIR
Copper	4.21	5.27	ug/g	Wet Chemistry
Phosphorus	0.11	0.14	%	Wet Chemistry *
Potassium	0.82	1.03	%	Wet Chemistry
Sulphur	0.07	0.09	%	Wet Chemistry *
Magnesium	0.10	0.13	%	Wet Chemistry
Zinc	15.13	18.93	ug/g	Wet Chemistry *
Iron	78.98	98.85	ug/g	Wet Chemistry *
Manganese	134.94	168.89	ug/g	Wet Chemistry *
Sodium	0.03	0.04	%	Wet Chemistry
OTHER				
Starch	1.37	1.71	%	NIR
Total Ash	5.12	6.41	%	NIR
Crude Fat	0.17	0.21	%	NIR
NFC	15.91	19.91	%	Calculation
Relative Feed Value	77.01	77.01		Calculation

is calculated by dividing the dry matter Ca (%) by the dry matter P (%).

MINERALS

On an average feed analysis sheet, two other related minerals are reported: magnesium (Mg) and potassium (K). These two minerals, in combination with calcium (Ca), make up the tetany ratio, which is K/(Mg + Ca). The combination of high K (Rule of Thumb - over 1.75%), and/or low Ca (Rule of Thumb - under 0.6%) and low Mg (Rule of Thumb - under 0.3%) can lead to grass or winter tetany and other animal performance issues.

RELATIVE FEED VALUE RFV

The higher the RFV the better the quality. It is used to compare forage varieties, match hay/silage inventories to animal requirements and to market hay. If the RFV is greater than 151 it is ranked as 'prime' quality and suitable for high producing dairy cattle. The RFV acceptable values depend on type and age of the animal.

- 115 - 130 for beef cow and her calf
- 100 - 115 for dry cow, heifer or an idle horse

THE NEXT STEP

Once you understand the quality of their individual feeds, the next step is to determine the quantity of feed required, both for individual animals per day and for the herd for the winter. Complete inventories of each feed that you have available for use. Estimate the length of feeding period and total number of animals to be fed. Using the feed inventory information and animal days of feeding, rough estimates can be calculated to determine how much feed is available per head per day to be able to make it through the entire feeding period. For additional information on Ration Balancing visit: www1.foragebeef.ca. Alberta Agriculture and Forestry sells an easy to use ration balancing program called "CowBytes". Here is a link to this program https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex12486

In the next newsletter (This is a pretty good hay….! - Part 2) I will talk about consumption and ration balancing. Before relying on any of these rules of thumb, it is important to consider all of the factors involved and the natural variation that is expected in animals. Knowing the variation in your feeds gets you one step closer to providing a ration that meets the animal's needs and your expectations for performance and profit. Consult your Nutritionist or contact Fito at the WCFA office to talk about your feed needs for next winter.

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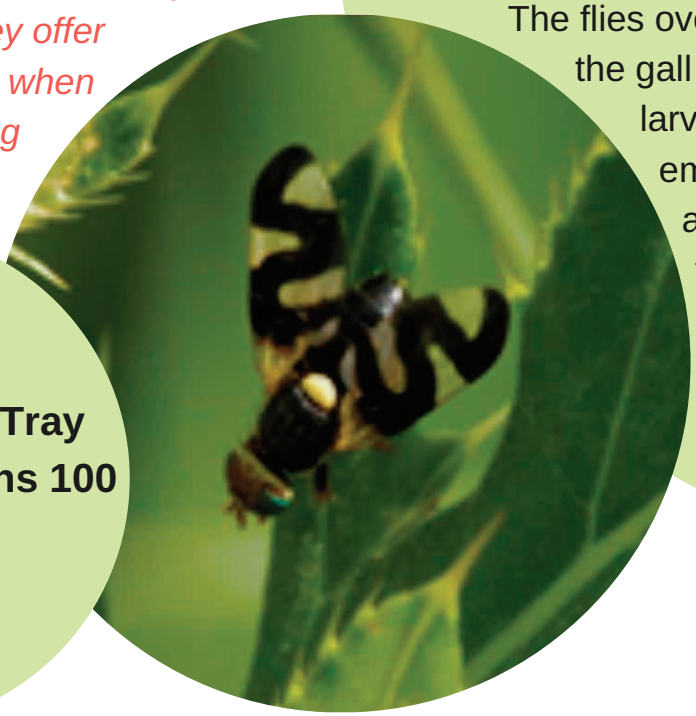

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WEST-CENTRAL FORAGE ASSOCIATION

THE COWS ARE CALLING: MOTIVATIONS FOR MANAGEMENT-INTENSIVE GRAZING PRACTICES AMONG BEEF FARMERS IN ALBERTA, CANADA

ERIKA HEIBERG (MASTER'S THESIS SUMMARY – COMPLETED NOVEMBER 2017)

In the summer of 2016, I set out to understand why management-intensive grazing (MIG) is gaining ground among farmers in Alberta. Through interviews, pasture walks, endless cups of coffee shared around kitchen tables, and many hours of driving through the Alberta landscapes, I strived to learn how and why these farmers have changed their grazing practices from conventional agricultural methods to ones grounded in agroecology.

MIG is considered a modest rotational grazing system. However, the term MIG is favoured because it focuses not only on the rotations or the pasture, but the management. For some, MIG is not only a grazing system, but a form of grassland management driven by three main goals: lifestyle, financial, and environmental (Gerrish 2004, 13-14). This makes MIG a whole systems approach to grazing and grassland management and an alternative practice to conventional feedlots or continuous grazing systems for beef cattle (Schoenian 2011).

To understand how MIG can fulfill these different goal areas, I used a theory known as Repeasantization, which was popularized by Van der Ploeg (2008, 6-7) to label a re-emergence of peasant farming. In response to an economic squeeze on agriculture, farmers opt for cost reductions on their farms, which results in practices with fewer inputs and lower commodification of labour. This repeasantization is defined by a search for greater autonomy from political and economic forces using two categories of practices: co-production, in which nature and humans are understood as interacting to create mutual and dynamic transformations, and diversification of income activities, both on and off the farm (Van der Ploeg 2014, 1017). MIG focuses on building land productivity, integration of animals with the landscape, and low input production. As such, I argue that the farmers I interviewed have gone through a process of repeasantization. These farmers range from organic producers to adapting conventional techniques, and from direct marketers to selling in the commercial market.

MIG AND DIVERSIFICATION

To understand what motivates farmers to use MIG, I needed to

understand the context in which farmers use these practices. All of the farmers I interviewed diversified the moment they decided to integrate livestock with the land using MIG. They took a single enterprise – beef production – and intertwined it with the production of forages and other crops. However, in many ways this was merely a point of departure for this study; as I got to know more and more farmers, it became clear that MIG linked a very diverse group of people. I focused on two examples: mixed farming and off-farm jobs.

Did you know that approximately 47% of farmers in Alberta reported having an off-farm job in 2015 (Statistics Canada 2017a)? I found that the main reason farmers held an off-farm job was to build capital to invest in their farms, but I mainly focused on the ways farmers diversified on-farm. Some farmers had a mixed farm, which allowed them to integrate their different enterprises and build upwards on their land base to expand their production, rather than building outwards. That way, farmers could produce more with what they already have. I met one farmer who talked about how his beef cattle, dairy cattle, sheep, pigs, cropland and apiary all work together to create a cohesive production system.

Others opted for value-adding practices by focusing solely on producing beef, but increasing the value through production, marketing, and story-telling. Farmers would produce grass-fed and -finished beef, or adapt their production system to earn a premium by raising natural or organic beef. Both types of production follow certain guidelines and certifying their production through VBP+, McDonald's Verified Sustainable, or Organic certification can show that these farmers produce more than 'just beef'.

And some farmers generated extra income by communicating MIG knowledge to others. Some did this hands-on, by working as farm equipment distributors, or dealing with seed and fencing supplies. Others engaged in consultancy or workshop facilitation relating to grazing and cropping, or as Holistic Management Certified Educators. These positions involve supplying and spreading knowledge of both hard and soft skills that were not used in conventional agricultural practices.

CO-PRODUCTION

Farmers' motivations and use of MIG are co-produced, but these practices also help farmers develop a story – a connection to their farming practices and products. The way farmers spoke about their farms and landscapes depicted nature as a partner, and an active agent in their production system. This allowed them to increase their carrying capacity and decrease their inputs.

When MIG is appropriately used, carrying capacity improves over time, resources are made stronger,

and the production system becomes more efficient without needing a reboot. By utilizing MIG practices, these farmers co-produce with nature to create a production system that uses limited external inputs. The did this primarily by using their animals – the beef cow can serve multiple functions including fertilizing the land, harvest the crop, and planting seeds that had been mixed in with the mineral sources, etc.

AUTONOMY IN AGRICULTURE

Profitability was the most apparent reason for decreasing input use. Artificial inputs have been revolutionary in agriculture, and on the surface can seem positively powerful. However, all of this 'power' costs farmers money and autonomy. This loss of autonomy was demonstrated with the development of hybrid corn, as farmers gained better yields but lost control and power over their harvest and seed base. In contrast, these farmers use their local knowledge and expertise to decrease their need for inputs such as fertilizers and pesticides, decrease their need for off-farm income, and increase their autonomy in making financial/economic decisions.

By combining what I found on diversification and co-production, the many complexities of what farmers did and said became clear. The various layers of their narratives and practices build the stories behind their value-added products, but also explain their encompassing understanding of agriculture. They start with the soil, which builds the base of their livelihood. As these farmers build on their foundation, they increase their capacity and integrate their enterprises. By expanding upwards rather than outwards, they produce more with less, opening space for more farmers to come in; for more neighbours and greater community. These farmers have experienced gains financially, environmentally, and socially. They have created a lifestyle and livelihood with which they are satisfied. MIG may not be the answer for every landscape, but for the Alberta landscape it seems to work.

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> "Early season limitations in P availability can result in restrictions in crop growth, from which the plant will not recover, even when P supply is increased to adequate levels."
>
> Grant et al. Canadian journal Plant Science, 2001

> "One of the essential plant nutrients, phosphorous, is needed from the earliest stages of germination. Any deficiency during this time can greatly reduce the subsequent potential of the plant."
>
> Bolland, Bunbury, Paynter - Northern Agriculture Western Australia 2006

> "A starter fertilizer is most beneficial when the crop is planted into cold, wet soils regardless of the soil fertility status of the soil."
>
> ...Agronomy Facts 51., Penn State

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