



GEA DairyRobot R9500 Start-up Guide

The path to success!



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DairyRobot R9500 Start-up Guide: The Path to Success!

By preparing yourself, your staff, and your operation years, months, and weeks prior to start-up, you can optimally convert your conventional milking herd to a herd that is milked using a GEA DairyRobot R9500 Automated Milking System.

Many producers who install automated milking systems are not fully prepared for the commitment, labor requirements, difference in management practices, and overall lifestyle changes these machines bring with them. Starting up a new automated milking facility brings the emotions of frustration, anxiety and excitement. However, the more prepared you are for the transition, the better things will go during your start-up.

The DairyRobot R9500 allows producers the ability to be more flexible with their time during the day. They are no longer tied to fixed milking times when they have to

stop another farm task to milk cows. In addition, they are no longer physically milking cows any more, but on the other hand, they are now producers who milk 24-hours a day, 7-days a week.

This guide was made to aid producers in preparing for the years, months, and weeks prior to start-up. Use this booklet as a reference to prepare yourself, your staff, your herd, and your operation for milking cows successfully with a GEA DairyRobot R9500 Automated Milking System.

YEARS PRIOR TO START-UP.....	Page 4
THREE MONTHS PRIOR TO START-UP.....	Page 6
A MONTH BEFORE START-UP.....	Page 9
THE WEEK PRIOR TO START-UP.....	Page 10
THE WEEK OF START-UP.....	Page 12
THE FIRST THREE WEEKS OF START-UP.....	Page 14

Please note: Every dairy facility is unique and herd management practices can vary widely, along with herd characteristics and behaviors. The information in this guide is in general terms and based on averages - your experience may vary. Always consult with your local GEA representative for guidelines and recommendations regarding your specific operation.

YEARS PRIOR TO START-UP

HERD PREPARATION

Preparing your herd to be milked by the DairyRobot R9500 system years before installation can be beneficial.

Herds that have cows with rear teats that are too close together or cows with low udders that are too close to the ground, may find that these animals are not good candidates for an automated milking system because the teatcups cannot be attached properly. For this reason, some producers choose to prepare their herd years prior to start-up of the robot. Some producers will begin implementing breeding strategies to correct certain physical conformation characteristics while others choose to cull their poorly conforming cows and start with new cows that carry the optimal udder/teat profile. Whatever decision you make, be aware of your herd's characteristics and make a decision that is best suited for your operation.

Determining your herd size. Some dairy producers choose to increase their herd size when making the decision to install a DairyRobot R9500 system, while others decide to stay the same size. Whatever the case may be, make sure you have a plan for where you want to be in terms of cow numbers when you install the DairyRobot R9500 and then design your system accordingly. For example, if you plan to expand your herd to 240 animals, be sure you design your facility around four robots.

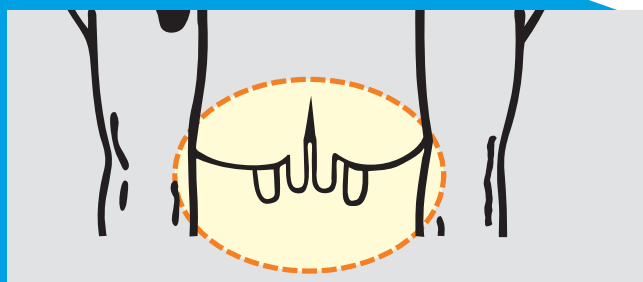
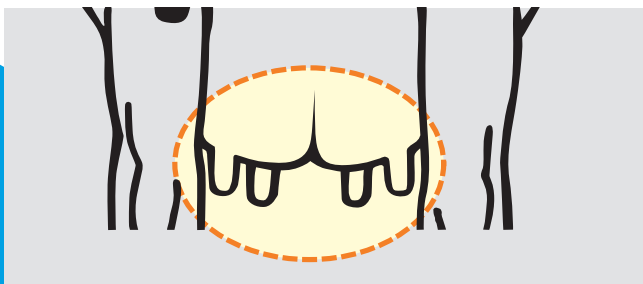
Also, make the decision of whether to build your herd from within or externally. Building your herd from within will take time and may delay your potential start date. Consider using

different strategies to accelerate the time it takes to reach your desired herd size (e.g. sexed semen). Buying animals allows you to expand quickly and move into a new DairyRobot R9500 barn faster. However, there are challenges when it comes to buying animals as well. Whatever you decide, make the decision that is best for your operation and plan accordingly.

Prepare your herd by breeding for certain conformation characteristics. Udder characteristics and feet and leg conformation will be two extremely important factors for cattle that are successful in automated milking systems. Udder characteristics you should try to avoid breeding for when preparing your herd include a reverse tilt, teats that are too short, or rear teats that are set too close together. Breed your animals for teats that are set squarely beneath the udder, udders that are well-attached and youthful, have level udder floors, and strong medial suspensory ligaments (MSLs) to ensure udders do not fall below the hocks too early in their lifespan.

As for feet and leg conformation, breed your animals to have offspring with feet that are set squarely beneath them. Animals with legs that are “hocked-in” may not get the teatcups attached optimally in the robot. Cows with teats that are set further towards the rear of the udder and the legs are “hocked-in” are not good candidates for a robot because the teatcups may have trouble fitting between the cows’ legs to attach to the correct teat.

In addition, the size of your cows should be considered. Some producers may choose to decrease the size of their animals while others may choose to breed for bigger cows. Whatever your preference, be sure you build a facility and your freestalls to suit your current and future needs. Incorrect stall sizing can hinder cow comfort, and reduce lying time, which can spiral into lameness issues, decreased feed intake and decreased production. Careful consideration should go into how you design a barn, so be sure this is a part of your decision process.



Top left: Teats set squarely beneath the udder are ideal for automated milking systems. Lower left: Rear teats that are set too close together can be difficult to attach.

It is important to be aware of the parameters for these important conformation characteristics and make decisions on what you feel is the best policy.

FINANCIALS TO CONSIDER

Thoroughly review maintenance and warranty

agreements. Many producers are unaware of the maintenance costs of these machines year-to-year. Be sure you have a discussion with your dealer so you are aware and prepared. Some things to be sure you understand clearly include, what is covered, what is not covered, and even what could possibly void a warranty. These are important things to openly discuss and be sure that you and your dealer are on the same page.

Include labor in your cash flow during the start-up period. This will give you breathing room during the most stressful points of start-up. Include labor costs of hiring personnel to cover night shifts as you (the owner) should be available during the day hours when important decisions are most likely to be made. However, be aware that the robots are milking your cows at all hours of the day and night and that if manual intervention is required in the middle of the night, you may get a call. Accounting for having extra labor in general, and particularly at night, will give you the opportunity to sleep and be refreshed to take on the day during start-up.

NOTE: Your GEA Automated Milking dealer can help create your labor schedule and may arrange for extra help during start-up, but they are not solely responsible for all labor. This is why including labor in your cash-flow is so important. Extra labor the first few weeks of start-up is essential and should be part of your financial planning.

BARN DESIGN

Visit other farms and producers to get advice and ideas.

To build your barn in the best way to fit your herd and your management style, you need to visit farms already utilizing automated milking technology. Ask these producers tips and opinions on how to successfully build and manage a barn with a DairyRobot R9500 system. Every barn is different, and every producer manages their barn differently. Be sure to visit multiple farms, not just one or two. Get a broad range of tips and opinions and you will quickly pick up on things you like about certain barn designs and things you do not like. Mesh all of your preferences into a great barn design just for your operation.

Build your barn with the cow in mind. This facility will be where your cows will spend nearly all of their time. Be sure you build a barn with the cow in mind first, then yourself. Choose a cow flow system that fits your style and goals. Animals that are comfortable and healthy will produce more for you and help you minimize fetch cows, mastitis, and cow health issues overall. When designing a barn, be sure to think about what is best for your operation and best for your cows.

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THREE MONTHS PRIOR TO START-UP

BEGIN INPUTTING COW DATA INTO DAIRYPLAN AND COWSCOUT™

Take some time to input data into your DairyPlan system.

If you previously used DairyPlan, have all your information transferred and start using your new computer. There is a different version of DairyPlan that you will use with the DairyRobot R9500 than you would have previously used on a conventional farm. Hence, you will need to have all of your data transferred. Getting it done early will help as the closer you get to your start-up, the busier you will become. You definitely want to avoid frantically trying to input data or transfer cow data the day before start-up, just so you can milk some cows. If all of the data is already in the system, all you will need to do the day of start-up is assist your cows through the robot and make small adjustments if needed, to account for errors in data input.

It is suggested that DairyPlan is used as your sole herd management software to avoid miscommunication between software, or lack of information in DairyPlan. This will help prevent separation issues and other mishaps. For example, if a producer utilizes PC Dart and DairyPlan, but enters information into PC Dart first, and DairyPlan second (using DairyPlan only for milking functions), and they forget to enter a treatment of penicillin into DairyPlan, and do not enter a separation due to antibiotics into DairyPlan, the DairyRobot R9500 will not separate the milk, due to lack of information entered into DairyPlan. For this reason, we strongly recommend using DairyPlan as the sole management software in your new DairyRobot R9500 facility.

GEA also recommends that you input all cow data into DairyPlan. Cow information includes birth dates, all calving dates, inseminations, dry-off dates, calves, and any other registration information or other information you would like to include.

In order for the DairyRobot R9500 to milk your cows once they enter the robot, it will need to know that the cow has calved and is in lactation. Animals considered to be “dry” or a “heifer” will not be milked. Calving dates will need to be included for this reason.

CowScout is the program used to monitor activities for the cows including activity for heat, rumination time, eating time, lying time, inactive time, etc. It is important that information entered into DairyPlan can be transferred easily to CowScout and that responder numbers are entered correctly for easy identification and correct information pairing. It is beneficial to start using your CowScout system as soon as possible as it will begin to start calculating individual cow averages and establishing norms. It will also give you the chance to get used to the system before the start-up begins. See Appendix D for explanations of basic functions of Cow Scout. If you have any further questions, please contact your local GEA Automated Milking dealer.

PREPARE YOUR COWS

Identify animals that will be successful with the DairyRobot R9500. There are a lot of factors determining whether cows will succeed in a DairyRobot R9500 or will have difficulty milking successfully. Make sure they are healthy and that once they are transitioned to automated milking, they are ready to succeed. Animals that require a hoof trimming should be dealt with before they enter the robot. Animals with sore feet will not enter the robot voluntarily as quickly as animals that do not have foot problems.

Be sure cows are in good condition and their dry matter intake is not compromised in any way (they have a good feeding program that is optimally balanced and consumed). Changing routines for cows is stressful on the cows and the producer. Ensuring animals are well-prepared for these adjustments in habits and processes will aid in a smooth transition.

DAIRYROBOT R9500 START-UP CHECKLIST

Be sure you have the “DairyRobot R9500 Start-up Checklist” as a quick reference guide to aid in your planning and preparation for start-up. A copy can be found under Appendix A in the back of this booklet.

Also, check for any somatic cell count (SCC) issues. Try to treat or determine an alternative treatment method (e.g. early dry-off) for any cows that have a high SCC. Any sick cows should be treated and brought back to normal health. Animals that are sick are under stress, and they will only be put under increased stress during the start-up. Healthy cows will transition better than sick cows.

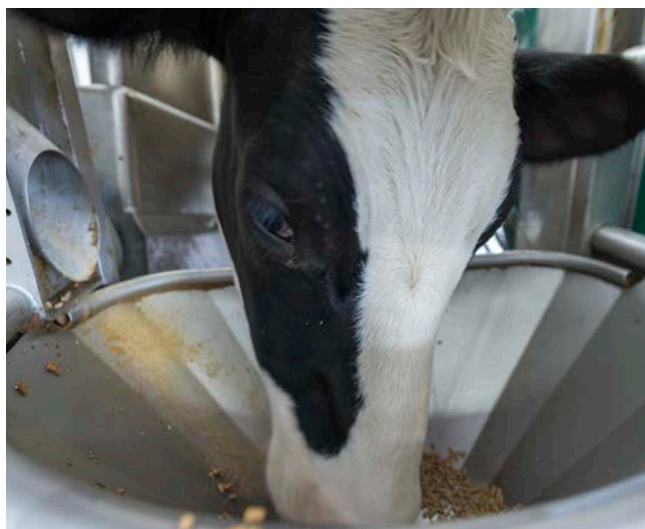
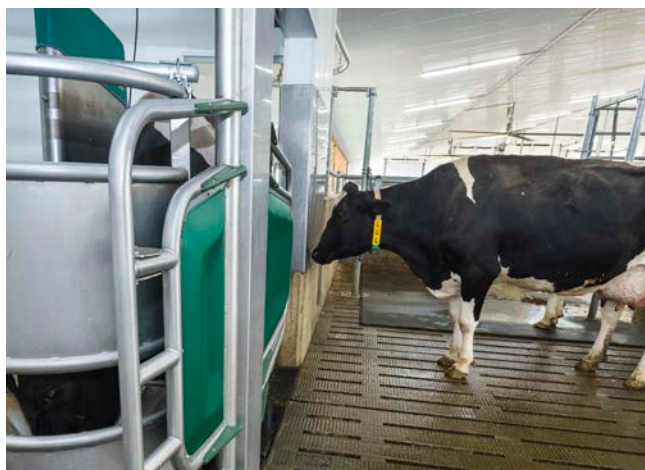
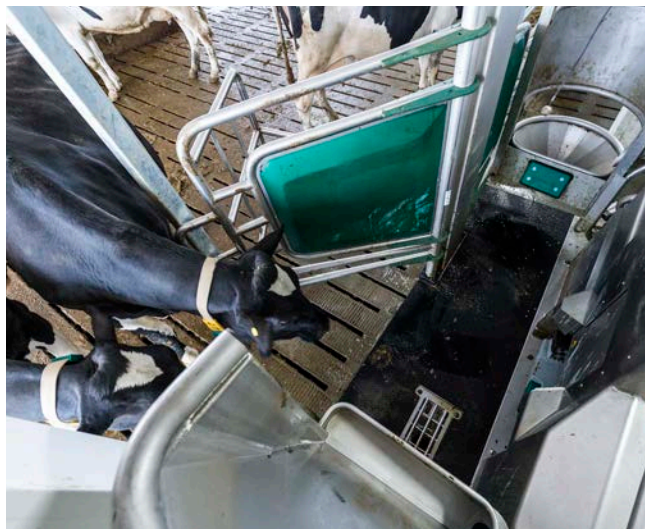
As mentioned in the “Years Prior” section, animals with certain conformation characteristics may not be successfully milked in a DairyRobot R9500 and may continually be a manual attach cow. Identifying these animals will aid in addressing the problem and determining the best solution. Some producers choose to keep these animals until a new animal enters the herd, or some choose to not milk them via the automated milking system.

Discuss ration changes with your nutritionist and herd management specialist(s) to determine a path to success.

The only major ration change during start-up should be the switch from a Total Mixed Ration (TMR) to a Partial Mixed Ration (PMR). Any other significant ration changes should be made well prior to start-up so they do not hinder your success.

The amount of pellet your cattle eat during the first week will all depend on how acclimated they are to the robot. Animals that have never entered the robot previously or have not had the pellet as a consistent part of their diet may not eat much of the pellet when they first enter the robot. For this reason, do not change the ration when you enter the robots. Keep it consistent. If animals have entered the robot prior to start-up, keep it simple for the first week until you are sure your cows are eating the pellets consistently, and daily average milk yields are also consistent or back to normal levels. Discuss these future changes with your nutritionist, as the ration may need to be adjusted as the amount of pellet the cows are consuming increases throughout the start-up period.

Discuss any changes in health management with your vet. Changing a milking system will bring its challenges. For example, the way you will implement herd health checks and footbaths may be different from your conventional system. Discuss how often you would like regular hoof trims, health checks, and any other health subjects that are important to you with your vet.





A MONTH BEFORE START-UP

CREATE A LABOR SCHEDULE FOR START-UP

Make a labor schedule for the first three weeks of startup.

The schedule should include different shifts, who will be responsible for being there on those shifts, as well as what robots they are responsible for managing. The hours will depend on what you are most comfortable with having, whether that is 6-8 hour shifts or 12-hour shifts. If you are starting up more than one or two robots, you will need more people and will need to be more specific on the roles each individual will hold.

The first week will require the most help moving cows through the robots. Depending on how well your cattle are adjusted to the robots or if you have the opportunity to utilize a “training period,” this could shorten or lengthen the amount of time needed to push cows through the robot. There should be discussion between the dealer and the producer about how to fill in this schedule. A sample schedule for you to view can be found in Appendix B of this booklet.

There should be discussion between the GEA Automated Milking dealer and the producer about how to fill in the labor schedule for the first three weeks of start-up. A sample schedule for you to view can be found in Appendix B of this booklet.

PLACE RESPONDER NECK TAGS ON YOUR CATTLE

Responder neck tags should be placed on animals prior to start-up. These tags include the opportunity to place numbers on the side of the neck for easy identification. It is suggested that the number you place on the neck collar matches the cow's number used to identify her in some fashion. These collars include a responder with a specific 15-digit code. This is the responder number. This number is then used to correspond to the cow wearing that specific tag. Be sure to double check all responder numbers in DairyPlan to ensure they are all entered correctly.

INTRODUCING THE PELLET

Most producers choose to introduce the pellet prior to start-up. This gives cows something familiar when they enter the robot for the first time. Some ways to incorporate pellets into the ration prior to start-up are including it in the ration itself, top-dressing the TMR, or adding it to a grain mix for component-fed rations. Have this discussion with your nutritionist to decide what is best for you and your operation.

REMOVE HAIR FROM THE UDDER AND TAIL PRIOR TO START-UP

Excessive hair on udders and tails may be troublesome for cows as they begin milking with the DairyRobot R9500, as well as a cleanliness issue. Udders that are shaved or singed, and tails that are trimmed, will allow for better attachment efficiency and increased cleanliness. Start your cows off right when they enter the DairyRobot R9500 by performing this simple task to increase your success with automated milking.

IF TIME IS ON YOUR SIDE

Some operations have benefited from implementing a robot training period when the luxury of time is available after the installation is complete and before start-up begins. This period would allow cows to walk through the box, be identified and fed. It allows the cows to get accustomed to the automated milking environment before actual cow milkings begin to help make the start-up period go smoother. If you are interested in implementing a training period, please contact your GEA Automated Milking dealer or local Herd Management Coordinator.

THE WEEK PRIOR TO START-UP

FINALIZE ENTERING COW DATA INTO DAIRYPLAN

Take the time to finish uploading all cow data into DairyPlan (if you have not already done so). You won't have a lot of time to input data once the DairyRobot R9500 is fully operational. It is recommended to take the time to sit down and finish inputting your data a few weeks in advance of start-up. This data is required in order to milk your cows. The software will need to know that your animals have calved and are in lactation. If the system thinks animals are dry or are heifers, it will let them out of the box and they will not be milked. Also, be sure to input any animals milking in only three quarters, properly notating the quarter that is not milked into DairyPlan.

Specific herd management reports should be created and utilized prior to start-up. For example, any reports used for reproduction set-up shots, such as OvSynch™ protocols, should be made and used to ensure they are set-up correctly and data is entered into the program correctly. This gives you the opportunity to fine-tune any issues before start-up.

FINALIZE LABOR SCHEDULE

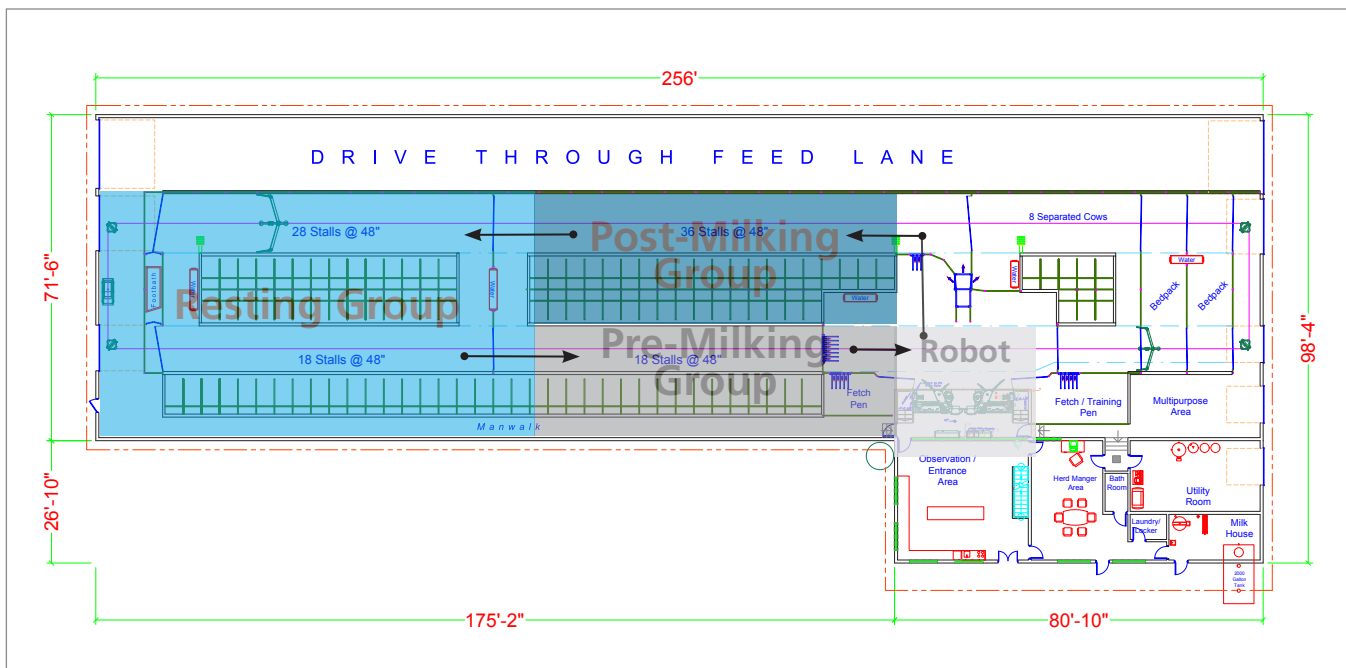
As mentioned, a schedule for labor for the first week of start-up will be critical. As you are learning how to manage the robot for the first week, having some help pushing cows will decrease the amount of stress. You will have more time to learn

how to bring new animals onto the robot as well as how to fix any technical specifications or small issues that may arise during this week with your technician. Make sure, as the owner/primary manager that you schedule time to be away from the barn for sleep and/or other chores. Some producers find themselves spending 36 straight hours in the barn without realizing it. Take time to leave the barn, it will be there when you return.

COW FLOW PREPARATION

Make sure you have gates available for start-up. The cow flow during start-up for the robots will be different than how your robots will be managed after the start-up process. You will need gates to help guide cattle to the robots. Usually, cattle are split into two groups. How the flow is set up will change depending on the number of robots per pen and how your barn is set up for cow flow.

Usually two groups works well with one group being the resting group and the other group split between a pre-milking group and a post-milking group. Animals will be split evenly, with half of the animals in the resting group and the other half in the pre-milking group. As cows begin going through the DairyRobot R9500 to be milked, they move into the post-milking group. Once all animals from the pre-milking group have been successfully milked, they should all be in the post-milking group. Animals in



the resting group are then moved into the area of pre-milking and all animals from the post-milking group are then moved to the area of resting.

This process will go on continuously for the first few days until cows begin entering without much assistance. The goal is to move all cows through the DairyRobot R9500 at least three times a day. As the week goes on, cows will go through the robot on their own and only a few cows will be required to be helped through the robot. By the first couple days, some cows will understand to move through the robot on their own and less labor will be required. This process will continue until a good majority of the cows enter the robots without assistance and then temporary gating can be removed. By the end of the second week, 80% or a majority of the cows should be entering the robot voluntarily.

FEED TABLES

Correctly setting up your feed tables the first week is important. Discuss all feed table set-up procedures and allocation of feed with your nutritionist and GEA Automated Milking dealer to ensure they are set-up correctly. Most often, during the first and second push of a start-up, animals are automatically given two pounds of pellets per visit, to ensure they get some amount of feed, but reduce the chance of overfilling the feed bowls. This is a recommended amount to start with due to the fact that some cows not eating all of the feed they are dispensed during the first few pushes through the robot. They may be more preoccupied with the movement of the robot arm underneath them and forget to eat the pellet in front of them. Be alert to the amount of milk your cows are averaging before you turn on feed tables to ensure you don't limit high producing cows who have decreased production during the week of start-up, but will increase in milk after start-up. Feed in the robot should be increased throughout the first week of start-up until cows are eating a consistent amount and milk averages are stable. Only then, should feed tables be enabled.

SOFTWARE AND FUNCTIONS

Become familiar with the software and functions of the DairyRobot R9500. Take the time to learn how the DairyRobot R9500 functions. Some basic features will be helpful the week of start-up such as:

1. Manual Attach
2. Gate Control Mode
3. Supervised Mode
4. Service Mode
5. MView Features
6. How to Change Milk Filters

Understanding how these features work before start-up will help you during the start-up process. Check your DairyRobot R9500 operation manual and work with your GEA Automated Milking dealer for help regarding the DairyRobot R9500 functions.

MAKE FINAL CHECKS

Be sure to refer to your DairyRobot R9500 Start-up Checklist that you began three months prior to start-up to ensure everything is completed and you are ready for a successful start-up. It is usually recommended that the start day is on a Monday or Tuesday, with the previous day (Friday or Monday, respectively) available to do final checks to make sure you are ready to milk utilizing the DairyRobot R9500. This allows you a full week to start-up and that the following weekend will be easier to handle when people leave your dairy.

THE WEEK OF START-UP

MAKE REALISTIC GOALS

Go for first base, not the home run. The first week is going to be full of challenges and frustrations. Do not let this leave you disappointed or upset. Starting up a new technology is exciting and challenging all at the same time. Some cows may not be comfortable during their first milking experience with a metal arm moving underneath them where they cannot see. Many cows will kick at first. But they will become more comfortable the more they enter the robot. Some cows will pick up on the concept quickly and it will be smooth sailing from there. However, cows are going to look tired during the first week of start-up. You are changing their schedules and starting something new. It is important to give cows in the resting group ample water, feed and lying space to ensure they are well rested for when they enter the pre- and post-milking groups. Whatever the situation, be open minded and aware of the challenges to come.

Plan for a likely dip in production. It is important to set realistic expectations for milk production during the start-up period. Producers see variability in production numbers during the start-up period depending on the herd's transition. Sometimes, it all depends on their environment. In retro-fit situations, cows are already used to their environment. They are simply being milked in a robot, rather than being moved 2-3 times a day to a parlor. These animals already know where the feed is, where waterers are, and where to lie down; all that is being added is the new milking schedule. Animals that are moved to a new facility on the same day they begin entering the robot, may take a little longer to transition. They are entering a completely new schedule and environment at the same time, and need time to adjust to both.

The milking schedule is disrupted in the way these animals are brought to the place to be milked. Disruptions in schedule include: going from 2X milking to 3X milking through the robot, cows entering on their own will, rather than by an individual handler, and cows are no longer on "synchronized" schedules for milking time, rather they are unique to each animal. Their environment will also change in terms of their feeding program (if it is not a new facility). A PMR will be utilized, rather than a TMR. This difference is due to part of the ration being fed in the DairyRobot R9500, and only part of the ration being fed at the bunk. Creating a nutrition plan that best fits your operation's goals should be a priority before start-up.

KEEP IT POSITIVE

Make sure that a cow's first milking experience in the robot is the best it can be. Animals that have an undesirable experience the first time they are milked in a DairyRobot R9500 will take longer to train and will not enter the robot without assistance as quickly as other cows. Make sure everyone who is helping you has an understanding of basic animal husbandry. People making loud noises, moving cows too quickly, and slapping animals to move them into the robot will be detrimental to your start-up. Be patient and kind with your cows when starting up the robots. It is recommended to push cows through the robot three times a day. If you are going to run the robots to near full capacity, you may not get through three turns the first day, but it should be fairly close.

The quote noted below by W.D. Hoard, made over 100 years ago, sums this point up nicely. Once you lose your temper and become rough with animals, their effectiveness to you is lost. Treat them with respect and care. The first week may be frustrating, but remember you are uprooting cows from their previous environment and expecting them to move to a new one, outside of their comfort zone. These animals will understand their new environment, just be patient in giving them the opportunity to adjust.

"The rule to be observed in this stable at all times toward the cattle, young and old, is that of patience and kindness. A man's usefulness in a herd ceases at once when he loses his temper and bestows rough usage. Men must be patient. Cattle are not reasonable beings. Remember that this is the Home of Mothers. Treat each cow as a Mother should be treated. The giving of milk is a function of Motherhood; rough treatment lessens the flow. That injures me as well as the cow. Always keep these ideas in mind when dealing with my cattle."

– W.D. Hoard

FETCHING THE FIRST WEEK

During the first week, the hope is to maintain some parameters. The goal during the beginning of the week is that your cows will go through the robot three times a day.

As the cows become acclimated to the robot, you will remove the gates and let cows enter voluntarily. However, not all cows will go and fetching will be required. An acceptable range is to maintain around 2.5 or greater milkings per cow per day. The first couple of weeks will include a lot of cows to fetch to achieve this goal. Even though these first few weeks can be daunting, improvements will be continuous as more and more cows begin entering the robot on their own.

Depending on when gates are removed and the manual push of cows is over, you will begin only fetching cows that do not enter the robot on their own. During the first week after the gates are removed, you may find that fetching cows every 3-4 hours will work best. Fetching will then move to every 6-8 hours, and then to a normal chore routine. Animals that should be fetched include:

1. Animals with an expected milk yield of over 30 pounds.
2. Animals away from the robot more than 14 hours.

It should be noted that there will still be quite a few fetch cows in the first couple of months. Don't be discouraged. It takes three weeks to form a habit in humans and this is usually a pretty good standard for cows as well. The longer you are in the barn, the easier it will get. Cows will learn to go on their own and your fetch list will diminish. However, some cows that are later in lactation during the start-up may not go on their own until the next lactation. Some cows that are older and used to an old system of milking may never learn to enter the DairyRobot R9500 on their own and may need to be fetched on a consistent basis. Being aware of these issues will aid in dealing with them when they occur.

MEASUREMENTS AND AVERAGE CALCULATIONS

During the first week, averages are being calculated for individual cows concerning activity readings and conductivity readings. It takes seven days for production averages and health measurements to be accurate for individual cows in DairyPlan. While milk production typically drops during start-up, it should continue to climb as the first week progresses. Also, during the first week, you want to be sure to check animals with increased conductivity values over 1,000, until averages are formed. Each animal will have her own unique conductivity levels. Reports monitoring conductivity can be used during the second and third weeks of start-up once averages have been created and normalized.



THE FIRST THREE WEEKS OF START-UP

ACCOUNT FOR DIFFERENCES

Each cow is going to create her own unique schedule.

Some cows will quickly pick up on entering the robot on their own, and will never be a fetch cow. Some cows that are older and set in their ways may never learn to enter the robot on their own. In these instances, it's important that these cows are not trained to enter the robot only when you enter the barn. They need to enter the robot on their own schedule, not yours. Be ready to let cows figure it out and go on their own. Once in a while, you may need to let a cow go a little longer and see if she will enter the robot on her own will. Depending on the farm, you may decide to keep or sell animals that never enter on their own. Some producers find it redundant to keep fetching these same animals every day and decide to let them go to reduce the overall amount of time fetching and focus on more productive tasks.

Revise groupings once the temporary gating is removed.

Most often, cows are placed in a 4-5X milking group during start-up to ensure they are milked when they are brought to the robot. Check the Optimize Milking Groups report for cows that should be placed into a separate group based on the number of times they are being milked a day. Cows that are being milked three times a day but are in a 2X milking group may not be getting the correct amount of feed. Once a week, check this list and make sure your cows are correctly placed in the right group.

Be ready to let cows figure it out and go on their own. Once in a while, you may need to let a cow go a little longer between milkings and see if she will enter the robot on her own will.

A FEW MORE THINGS TO KEEP IN MIND

During the first month of start-up, there should be as few changes in the environment as possible, outside of the introduction to the robot. A couple of examples being:

- (1) If long-day lighting is going to be implemented, it should be set from the very beginning of start-up. You do not want to have lights on 24-hours for the first couple weeks for your workers and extra help, and then turn on the long-day lighting, as this will alter the cow's behavior. Animals will be tired the first couple of weeks of start-up, but this will only compound the problem.
- (2) Feed should be laid down at the same time each day, as this will be especially helpful in determining how much the cows are actually eating or not eating.

Overall, in the first three weeks, ensure you are not letting cows get too many hours away from the robot. To help ensure you don't miss a cow or a cow doesn't get milked for 24 hours, fetch consistently for the first week or so. But, be cautious. Once the fetch list gets smaller and you get into a routine, don't become so consistent with fetching that cows become adapted to being fetched. If you fetch twice a day, spread your fetching hours out and fetch anywhere between 10-12 hours. If you fetch three times a day, fetch every 7-9 hours. After the initial start-up process, you will begin to find cows that only enter when you bring them to the robot. Mixing up the fetching times by an hour or two can sometimes get cows to enter on their own. With a robot, don't feel pressured to start chores or fetching at certain times. The beauty of these systems is flexibility. There will always be things that should stay consistent, including feeding times. But sometimes a little inconsistency can be good.

FOR MORE INFORMATION

Transitioning your milking environment to an Automated Milking System is an exciting yet challenging time. Rely on your GEA Automated Milking dealer and your GEA Herd Management Specialist for complete support to facilitate a successful DairyRobot R9500 start-up and subsequent milkings for years to come. Don't hesitate to contact your GEA team with any questions specific to your operation.



APPENDIX A – DAIRYROBOT R9500 START-UP CHECKLIST



DairyRobot R9500 Start-up Checklist

THREE MONTHS PRIOR TO START-UP

DEALER		PRODUCER	
<input type="checkbox"/>	Download DairyPlan and CowScout onto producer's computer.	<input type="checkbox"/>	Computer for office installed with internet and printing capabilities.
<input type="checkbox"/>	Communicate with GEA project execution team regarding start-up plans.	<input type="checkbox"/>	Discussion with nutritionist about future ration changes.
<input type="checkbox"/>	Submit state AMS application, if applicable.	<input type="checkbox"/>	Once DairyPlan and CowScout are downloaded onto producer's computer, begin to input all cow data (transfer or enter individually).
		<input type="checkbox"/>	Correct any hoof issues/complete necessary trimming.

ONE MONTH PRIOR TO START-UP

DEALER		PRODUCER	
<input type="checkbox"/>	Create and communicate start-up plan.	<input type="checkbox"/>	Create start-up plan and start-up labor schedule.
<input type="checkbox"/>	Determine where temporary gating will be placed.	<input type="checkbox"/>	Set up farm-specific herd management protocols.
<input type="checkbox"/>	Schedule state inspection date (close to start-up).	<input type="checkbox"/>	Put responders on cows and enter correct numbers into DairyPlan.
<input type="checkbox"/>	Complete Pre-DairyRobot R9500 Farm Evaluation.	<input type="checkbox"/>	Finish entering all remaining cow data into DairyPlan.
		<input type="checkbox"/>	Introduce pellet (month or week before, i.e. top dress TMR).

WEEK PRIOR TO START-UP

DEALER		PRODUCER	
<input type="checkbox"/>	Complete a wash and test milking before the start-up to ensure functions are in order.	<input type="checkbox"/>	Be sure all cow data is correct in DairyPlan (cows set to be milked, groups created, etc.).
<input type="checkbox"/>	Teat prep protocol, valve failure protocol, and farm representative information available in milk house.	<input type="checkbox"/>	Udder hair has been removed (clipped or singed).
<input type="checkbox"/>	State inspection completed.	<input type="checkbox"/>	Temporary gating available and ready.
<input type="checkbox"/>	Monobox set to begin milkings.	<input type="checkbox"/>	Has dealer explained basic robot functions?
		<input type="checkbox"/>	Finalize labor schedule.
		<input type="checkbox"/>	Discuss and set up feed tables with your nutritionist.
		<input type="checkbox"/>	State inspection completed.

APPENDIX B – SAMPLE START-UP SCHEDULE



Sample Start-up Schedule

Tuesday, March 21	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PIT	Bob	Bob	Bob	Bob	Bob
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER	Kate				
Wednesday, March 22	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PIT					
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER	Kate				
Thursday, March 23	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER	Kate				
Friday, March 24	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER	Kate				
Saturday, March 25	Robot 1 & 2					
	7A - 3 PM	3PM - 11PM	11PM - 7A			
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER	Kate				
Sunday, March 26	Robot 1 & 2					
	7A - 3 PM	3PM - 11PM	11PM - 7AM			
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					
Monday, March 27	Robot 1 & 2					
	7A - 3 PM	3PM - 11PM	11PM - 7A			
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					
Tuesday, March 28	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					
Wednesday, March 29	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					
Thursday, March 30	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					
Friday, March 31	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					
Saturday, April 1	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					
Sunday, April 2	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					
Monday, April 3	Robot 1 & 2			Robot 3 & 4		
	7A - 3 PM	3PM - 11PM	11PM - 7AM	7A - 3 PM	3PM - 11PM	11PM - 7AM
	PUSHER	Jim, John, Joe	Jim, John, Joe	Jim, John, Joe		
	PUSHER					

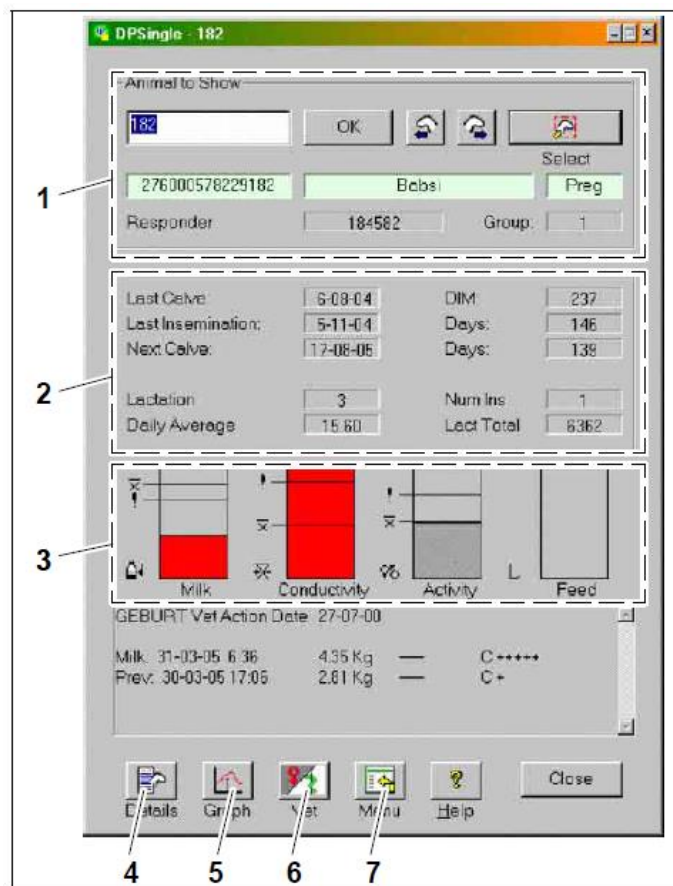
APPENDIX C -- GUIDE OF “HOW-TO’S” FOR DAIRYPLAN



The Simple Guide of “How-To’s” for DairyPlan

DPSINGLE EXPLANATION

1. Identification and status
2. Current lactation information
3. Graphs in this area show measurement results: (!) indicates an alarm value and (X) indicates the expected milk value.
4. Click on “details” to view all data available for this animal.
5. Click on “graph” to pull up graph generator for information on the animal. Graphs included show data on activity, milk and feed.
6. Click on “Vet” to enter data for the animal.
7. Click on “Menu” to return to the main menu.



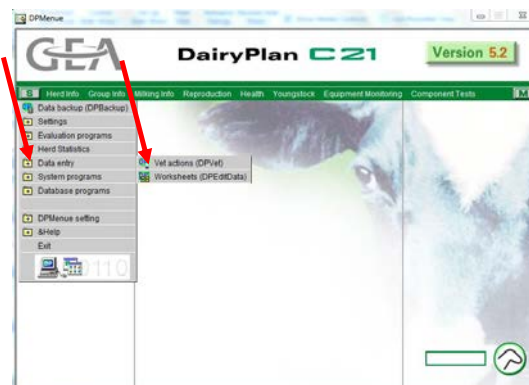
APPENDIX C – GUIDE OF “HOW-TO’S” FOR DAIRYPLAN

DPVET EXPLANATION

Open DPVet to input all data on the animal (i.e. breeding, pregnancy test, illness, dry-off, etc.).

Enter From DPSingle: Select “Vet”, third box from the right on DPSingle page (Refer to DPSingle Explanation).

Enter from Main Menu (image on right): Select Data Entry, then select Breed. Be sure to enter Animal ID since you are not coming directly from animal’s DPSingle.



DPVet Screen (Image to the right):

- A. Area to select action needed**
- B. Animal ID field**

Enter One Animal: Type animal's ID

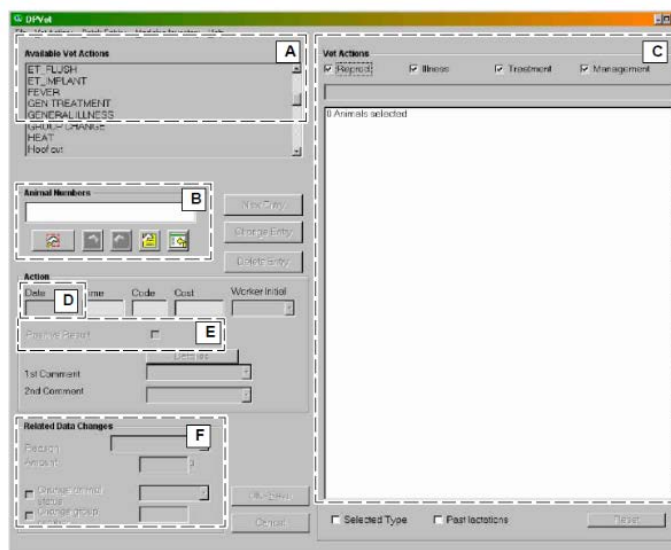
Enter Several: Enter numbers separated by comma or space

- C. Past and future vet actions**
- D. Date**
- E. Positive result**

Positive result (Pregnancy confirmed) is standard. If it is a negative result, check must be removed.

- F. Other changes:**

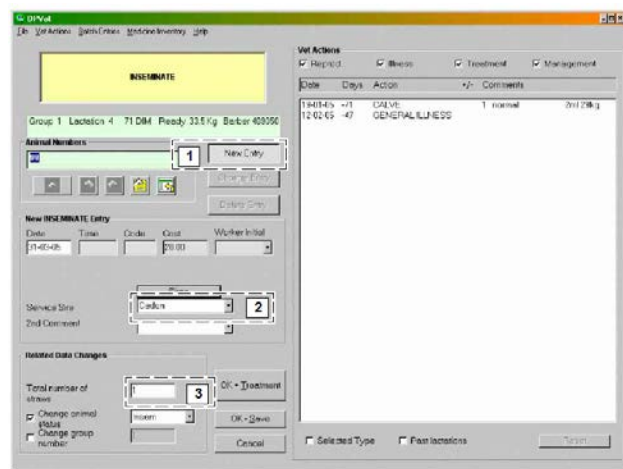
Animal status and group number can be changed here.



APPENDIX C – GUIDE OF “HOW-TO’S” FOR DAIRYPLAN

INPUTTING AN INSEMINATION

1. Enter DPVet.
Refer to DPVet Explanation section on how to open DPVet.
2. Type in the Cow Number (if not entering from DPSingle).
3. Select the vet action of BREED.
4. Select New Entry (Area 1).
5. Input correct date of insemination.
Individual who completed the breeding can be inputted under *Worker Initial*.
6. Select Service Sire (Area 2).
A comment can be left such as “blood on straw” or “no cervix tone” for further information if you desire.
7. Click OK – Save.
8. Breeding input complete.



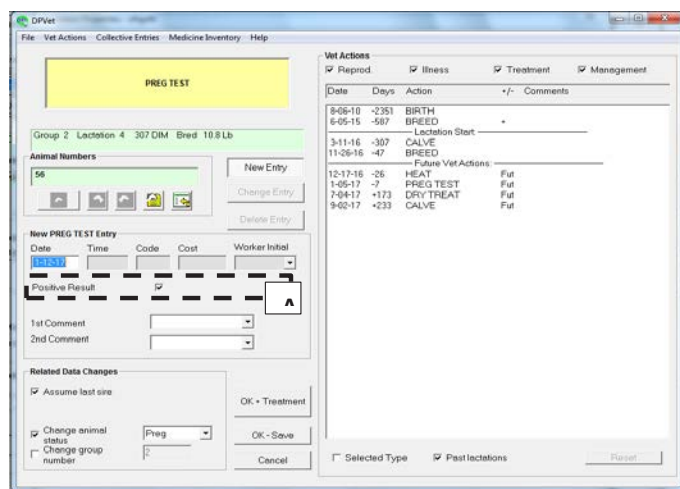
Note: Entering a breeding will trigger the following FUTURE vet actions: Heat in 21 days, Preg Test in 42 days, Dry Treat 230 days after, and an anticipated calving date 280 days later. These specifications can be adjusted if necessary.

INPUTTING PREGNANCY TEST RESULTS

1. Enter DPVet.
2. Select PREG TEST.
3. Select *New Entry*.
4. Enter the date.
5. Enter data depending on the result.

Positive Result:

6. Insert Date of pregnancy confirmation.
7. Check box for “Positive Result” (Section A).
8. You can leave comments if you wish.
9. Select OK – Save.
10. Positive Pregnancy test complete. Animal status will change to “Preg”. This will delete future actions for a heat and will keep future actions for dry off and calving date.



Negative Result:

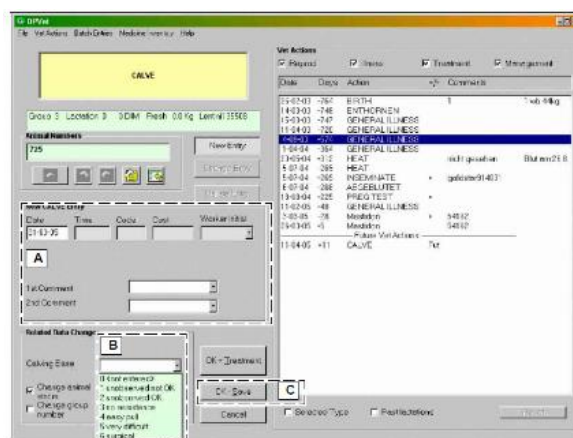
1. Insert date of pregnancy test.
2. Un-check box for “Positive Result” (Section A).
3. You can leave a comment such as (CL right or F1 left).
4. Select OK – Save.
5. Negative Pregnancy test complete. Animal status will change to “Open”. This will delete the future actions for dry off and calving date. It will keep a future action for heat.

NOTE: When a pregnancy is confirmed, DairyPlan will automatically assume that the last breeding resulted in pregnancy. If you bred within 10 days and the first breeding (not the second) resulted in a pregnancy, you will need to adjust that.

APPENDIX C – GUIDE OF “HOW-TO’S” FOR DAIRYPLAN

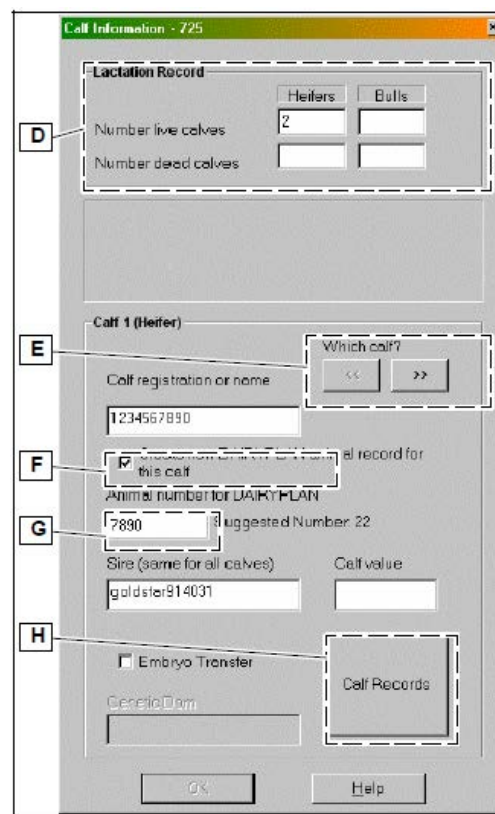
INPUTTING A CALVING

1. Enter DPVet.
2. Select CALVE and click “new entry”
3. Enter date of calving (Area A).
4. Enter Calving Ease information (Area B).
5. Select **OK – Save** to confirm entry.
6. Continue to calf information entry.



Once entry has been made, DairyPlan will automatically provide opportunity to enter any number of calves.

7. Enter the number of calves born (Area D)
8. Select entry form for multiple births (Area E).
9. “Record new calf” allows animal ID to be entered. Keep this box checked unless calf data shouldn’t be record (Area F).
10. Enter the animal ID to store calf data in data stock (Area G).
11. Selecting “Calf Records” will take you to the DPSingle of new calf to input additional information if needed (Area H).
12. Confirm by clicking **OK**.



APPENDIX C – GUIDE OF “HOW-TO’S” FOR DAIRYPLAN

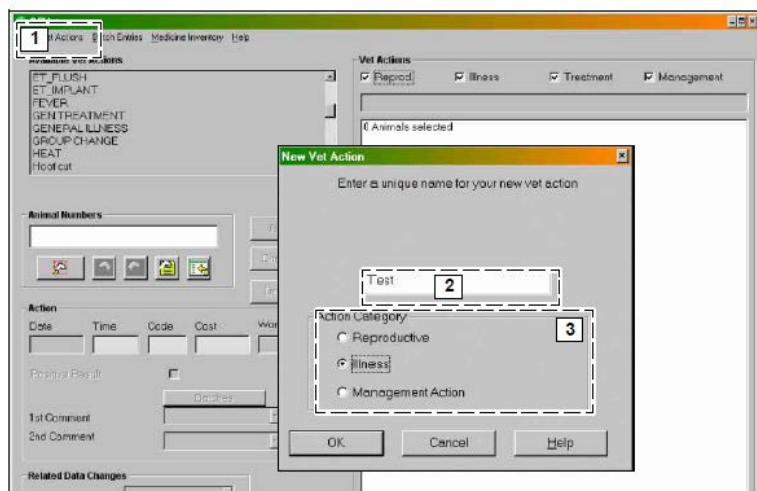
INPUTTING TREATMENTS & ILLNESS

This is similar to entering calving or breeding.

1. Enter DPVet.
2. Select Illness or treatment.
3. Select “New Entry”
4. Input correct date for event.
5. Input comments if deemed necessary.
6. You may choose to change the animal status under Related Data Changes if the animal needs to be put into a special needs group or sick group. If not, continue to the next step.
7. Select OK – Save.
8. Action Completed.

CREATING A NEW ILLNESS, INJURY, ETC. AS VET ACTION

1. Enter DPVet.
2. Near the top, under “Vet Action”, select “add new action”. (Area 1)
3. Input a name for the illness. (Area 2)
4. Select the actions category: reproduction, illness, or management. (Area 3)
5. Select OK.
6. New Action created.



APPENDIX D – BASIC FUNCTIONS FOR COWSCOUT



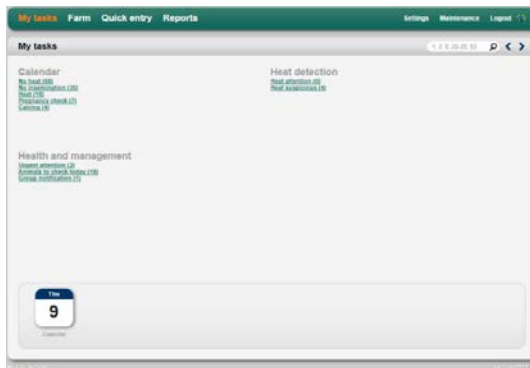
Basic Functions for CowScout

HEAT MONITORING

Alarms Notification (two activity alarm levels):

- [Heat Detection Attention](#)
 - At least 3 consecutive 2-hour intervals indicating increased activity
- [Heat Suspicious](#)
 - 2 consecutive 2-hour intervals indicating increased activity

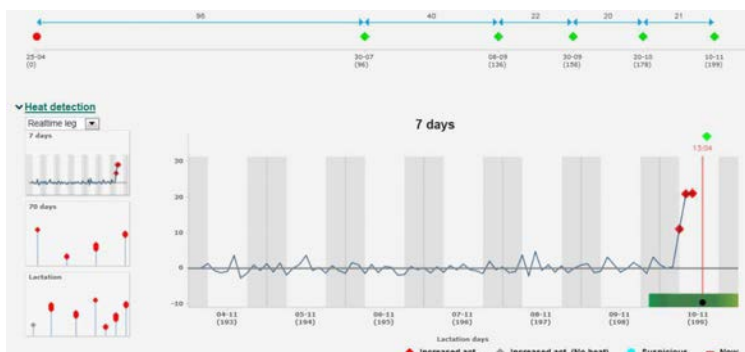
My Tasks Page: This is the initial screen you seen after user login, with links to active attention lists.



This is the Heat Detection Attentions list.

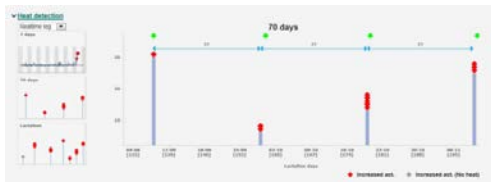
Animal	Group	Lact. days	Heat days	Breeds, days	Pregnant	Attention time	Optimal insemination moment	Add event
0002	Donor	3	209	1	1	08:00 (13 hours)		
0003	Donor	11	242	111	111	10:00 (11 hours)		
0004	Donor	11	209	209	209	10:00 (11 hours)		
0005	Donor	4	199	1	1	20:00 (11 hours)		
0006	Donor	4	458	1	1	20:00 (11 hours)		
0007	Donor	11	204	211	211	22:00 (19 hours)		
0008	Donor	9	238	167	167	00:00 (17 hours)		
0009	Donor	11	209	194	194	00:00 (17 hours)		
0010	Donor	8	124	55	55	00:00 (17 hours)		
0011	Donor	11	619	204	204	02:00 (16 hours)		
0012	Donor	4	168	20	20	02:00 (16 hours)		
0013	Donor	6	135	69	69	00:00 (19 hours)		
0014	Donor	8	115	25	25	00:00 (19 hours)		
0015	Donor	6	180	5	5	10:00 (17 hours)		
0016	Donor	1	90	20	20	12:00 (15 hours)		
0017	Donor	8	47			14:00 (13 hours)		
0018	Donor	3	324	32	32	16:00 (11 hours)		
0019	Donor	8	132	39	39	18:00 (19 hours)		
0020	Donor	7	170	23	23	18:00 (19 hours)		
0021	Donor	8	130	23	23	18:00 (19 hours)		

You can click on any cow in this list to bring up a detailed activity line in 7-day view.

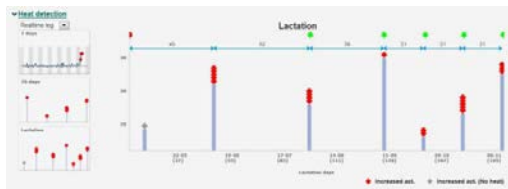


APPENDIX D – BASIC FUNCTIONS FOR COWSCOUT

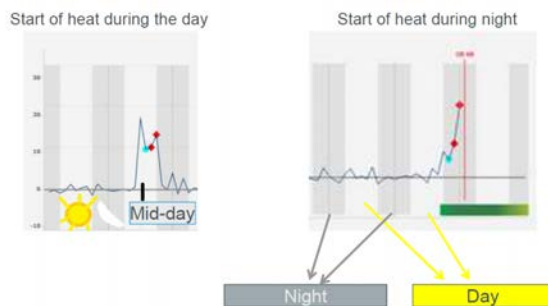
Or a 70 day view of the current lactation.



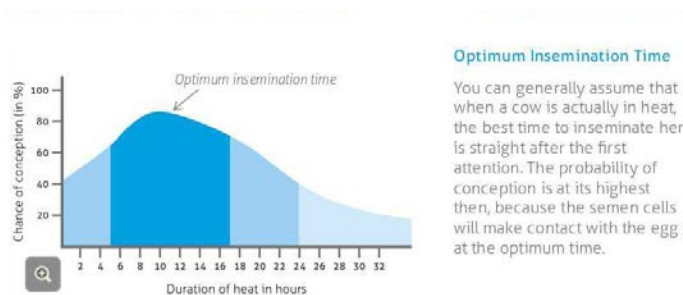
You can also view the entire current lactation to date.



Here is an example of two different heat events...one during the day, and one at night.

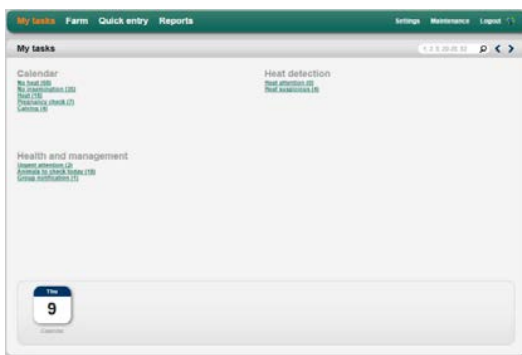


The green bar when viewing attentions list is the optimum insemination time.



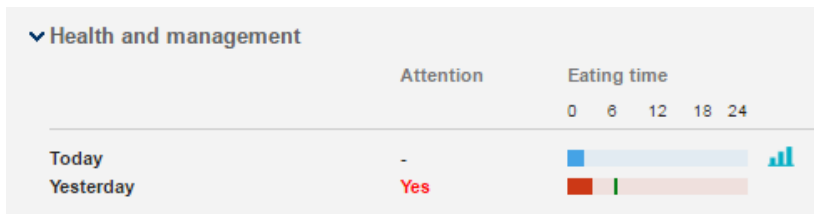
HEATH & MANAGEMENT—EATING TIME


Under the My Tasks page, animals with urgent attentions and animals to be checked can be seen.



APPENDIX D – BASIC FUNCTIONS FOR COWSCOUT

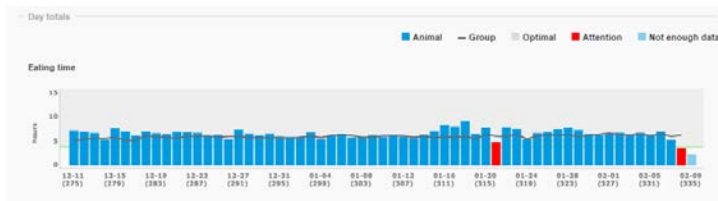
Individual animal measurements can be viewed. Below, you can see that yesterday this cow had an attention. The green line indicates her average eating time, and the red bar indicates her eating time yesterday. Today's measurements so far can be seen in the blue.



If you click on the bar graph , you can see the individual measurements by 24-hour view or by day totals (both below).

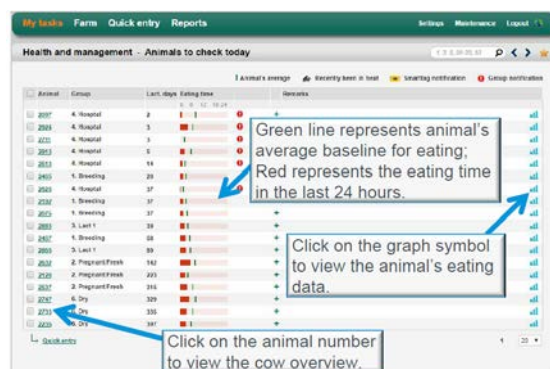


The vertical bars represent times when the cow ate.



Each vertical bar represents the time spent eating within the 24-hour period that begins and ends at midnight. The gray line marks the average baseline eating time. The lower limit of "normal" optimal eating time range is bordered by a green line.

Attentions are generated by percentage deviation from an established baseline average.



NOTES

NOTES



We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is one of the largest technology suppliers for food processing and a wide range of other industries.

The global group specializes in machinery, plants, as well as process technology and components.

GEA provides sustainable solutions for sophisticated production processes in diverse end-user markets and offers a comprehensive service portfolio.

The company is listed on the German MDAX (G1A, WKN 660 200), STOXX® Europe 600 Index and selected MSCI Global Sustainability Indexes.

GEA

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