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Automating dairy farms

Table of Contents

About this Guide and Scope....1
Applicable Documents....1
Safety....1
1 Introduction....2
2 Attaching AfiCollars....3
3 Assigning the AfiCollar to the Cow....4
3.1 Assigning AfiCollars Using Afi2Go Pro....4
3.2 Assigning AfiCollars by Manual Entry....9
3.3 Importing Data from an External Source....10
4 Storing and Maintaining AfiCollars....11
4.1 Storage Location....11
4.2 Storage Position....11
5 AfiCollar Based Reports....12
6 Identifying Possible Sick Cows....13
6.1 Understanding the Non-Specific Health Report....13
Detailed Report....14
Graph....15
6.2 Setting Non-Specific Health Report Alert Thresholds....16
General....17
Combined Rumination and Eating....18
Only Rumination/Only Eating....19
7 Identifying Group Feeding Problems....20
7.1 Viewing Group Digestion Report....21

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7.2 Understanding the Group Digestion Report 21
Group Digestion Report 22
Detailed Report/Graph View 23
7.3 Setting Group Digestion Report Thresholds 25
Alert type 26
Low daily rumination and eating time 27
8 Troubleshooting 28
9 Certification and Licensing 29
FCC Statements 29
IC Statements 30

About this Guide and Scope

This guide describes how to physically attach and then assign the AfiCollars to the animals, and the best practices for maintaining and storing AfiCollars. This guide also provides full descriptions of the unique reports available in AfiFarm to farms using AfiCollars.

Applicable Documents

Additional information can be found in the following document(s):

Link	QR Code
AfiAct II Managing Fertility User Guide	
AfiFarm ABC Dashboard User Guide	
Afi2Go Pro User Guide for AfiFarm 5.4	

Safety

This guide should be read carefully. Proper use of the Aficollar ensures proper functioning. It is the responsibility of the customer to attach, assign, and maintain the Aficollar in accordance to all applicable instructions and regulations.

1 Introduction

AfiCollar, along with Afimilk's herd management software, provides a comprehensive system for detecting heat events, and monitoring cow and heifer health.

AfiCollar measures the motion, rumination and eating behavior of cows. This data is interpreted by AfiFarm to provide updated, round-the-clock monitoring of cow health, fertility, and nutrition. AfiFarm uses this data to provide alerts to fertility events, issues affecting individual cows, or issues that affect entire groups.

AfiCollar works with AfiFarm's Standalone herd management system, **Afi2Go Pro** mobile application, and **Sort Identification System**.

2 Attaching AfiCollars

AfiCollars are delivered as a set of 10, and are fully assembled, ready to be attached.

The box and AfiCollars weight 10Kg/22Lb.

Safety Warning: Take precautions when lifting or moving the box, and make sure to place it on a flat surface where is cannot fall.

Before you start:

- Make sure there are no protruding parts in the pens that could get caught on the collars.
- Make sure the working environment is safe for you and the cow.
- AfiCollars are delivered dormant to save battery. Activate the sensors by standing them horizontally for 1-3 minutes.

Tip: to activate an entire box of AfiCollars, stand the box on its side for 1-3 minutes.

See AfiCollar Attachment Guide for a complete description of the attachment process.

3 Assigning the AfiCollar to the Cow

Once AfiCollars are attached to the cows, they must also be assigned to the cows in AfiFarm.

There are several methods available for assigning AfiCollars to animals:

- Assigning AfiCollars using Afi2Go Pro (see Chapter 3.1),
- Assigning AfiCollars by manual entry (see Chapter 3.2),
- Importing data from an external source (see Chapter 3.3).

3.1 Assigning AfiCollars Using Afi2Go Pro

Use the quick and intuitive Afi2Go Pro mobile application to assign AfiCollars to the animals. This method can be used in any location, once you have attached the AfiCollar to the animal (see Afi2Go Pro User Guide for AfiFarm 5.4).

Afi2Go Pro can be downloaded from Google Play and App Store:

Type	QR Code
App Store	
Google Play	
Baidu	

To assign AfiCollars using Afi2Go Pro:

1. Open the Afi2Go Pro app from the home screen.

2. Enter your Account Name and Password, then press **Login**.

The Search screen opens.

3. In the Search field, enter the cow's number. The autocomplete list opens as you type.
4. Select the Number from the list.

The Cow ID card opens.

5. Open the Events list: Press .

6. Select **Tag Assignment**.

The Tag Assignment screen opens.

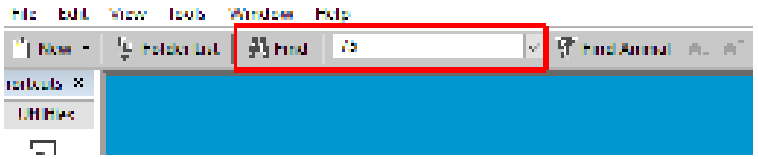
7. Scan the NFC sensor: Hold your mobile device close to the sensor.
8. Press **Save** once the sensor number is displayed in the **New Tag** field.

The AfiCollar is successfully assigned to the cow.

Once the assignment is complete, the cow ID card opens on the screen

3.2 Assigning AfiCollars by Manual Entry

Use the Cow ID card in AfiFarm to manually assign the AfiCollar to the animal. This procedure is best used when entering a small number of tags or re-assigning the AfiCollar to a different cow (in such situations you first need to remove the tag number from the original cow, before assigning to the new animal).



To manually assign AfiCollars:

1. Attach the new AfiCollar to the animal.
2. Locate the relevant cow: Enter the Cow ID in the Find field, and then press **Enter**.

The Cow ID card opens.

3. In the **Tag** field, enter the AfiCollar number, and then click **Save**.

Note: The AfiCollar number is located at back of the sensor.

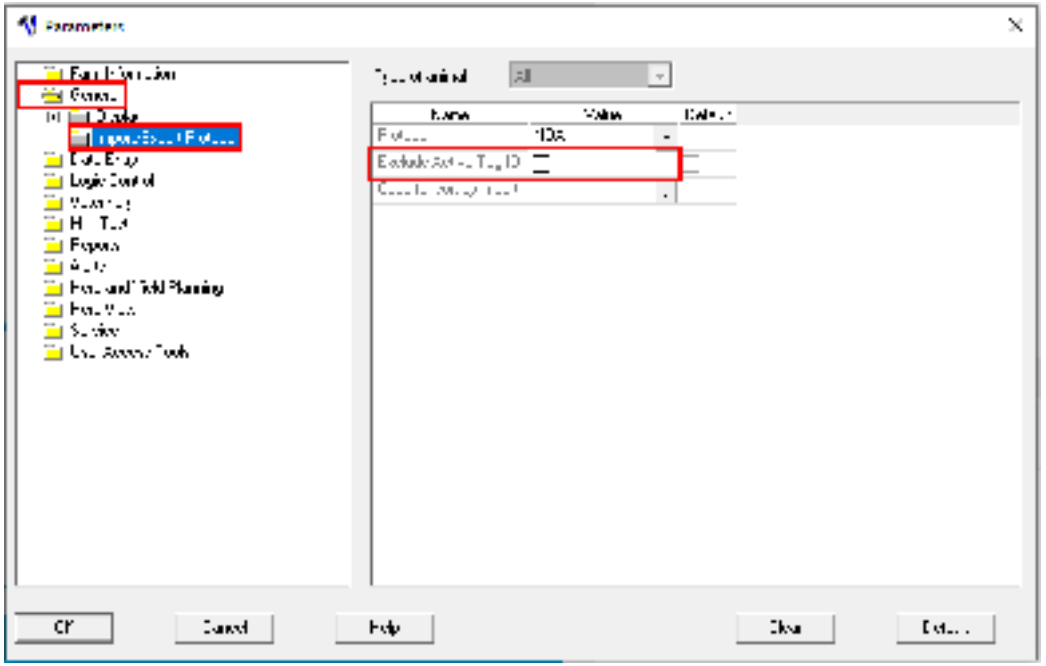
In the example at right, **AfiCollar 151000562** is attached to **Cow 75**.

3.3 Importing Data from an External Source

Contact Afimilk Support to set this up and perform your initial Animals import. Then have your Support representative schedule an automatic import of data which is updated on your Herd Management software.

Note: Currently, Sensor ID numbers are automatically excluded when importing cow data from an external source to AfiFarm.

To include the Tag IDs during the import the default setting needs to be changed. This is done in *Tools > Parameters > General > Import/Export Protocol* and unchecking the *Exclude Tag ID* check box.



4 Storing and Maintaining AfiCollars

AfiCollars are encased in sealed plastic containers.

After removing AfiCollars from cows, they may be washed under running water (warm or cold) before storage or before attaching to new cows.

Caution: Do Not Soak AfiCollars. Soaking AfiCollars in water for hours may reduce their life expectancy.

It is important to correctly store the AfiCollar while not in use, in order to extend its lifespan and ensure the parts are kept safe and available for future use.

4.1 Storage Location

Tags must be stored in a dry, protected area. Storage should be at least 1 meter (3 feet) away from any radiating device such as main power cables, PC screens, electric crowd gates, and other high-power devices.

Caution: Radiating devices may create an electromagnetic field that energizes the sensors, shortening their life expectancy.

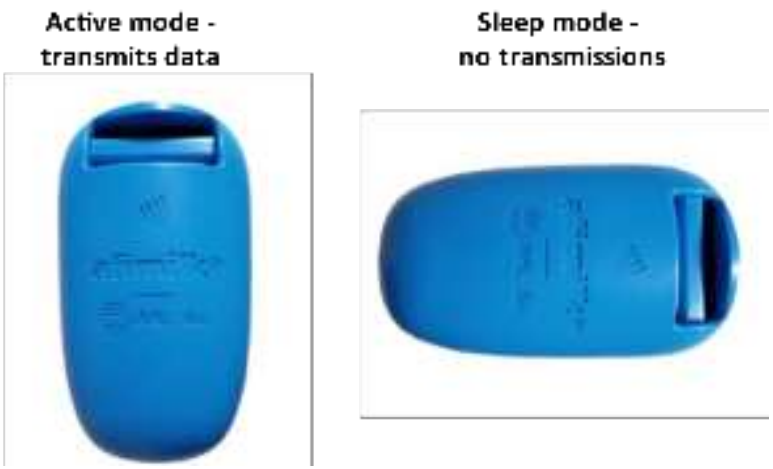
4.2 Storage Position

The AfiCollars only transmit when held in a vertical position. Therefore, place them horizontally when transporting or storing them.

After 24 continuous hours in the storage position, AfiCollar enters sleep mode. In sleep mode, it does not activate the transceiver nor measure heat and rumination. In addition, all stored heat and rumination data is deleted.

Holding the AfiCollar in a vertical position for 1-3 minutes returns it to active mode.

Following all storage and maintenance recommendations will ensure smooth operation, save battery life, and maximize the AfiCollars' longevity.



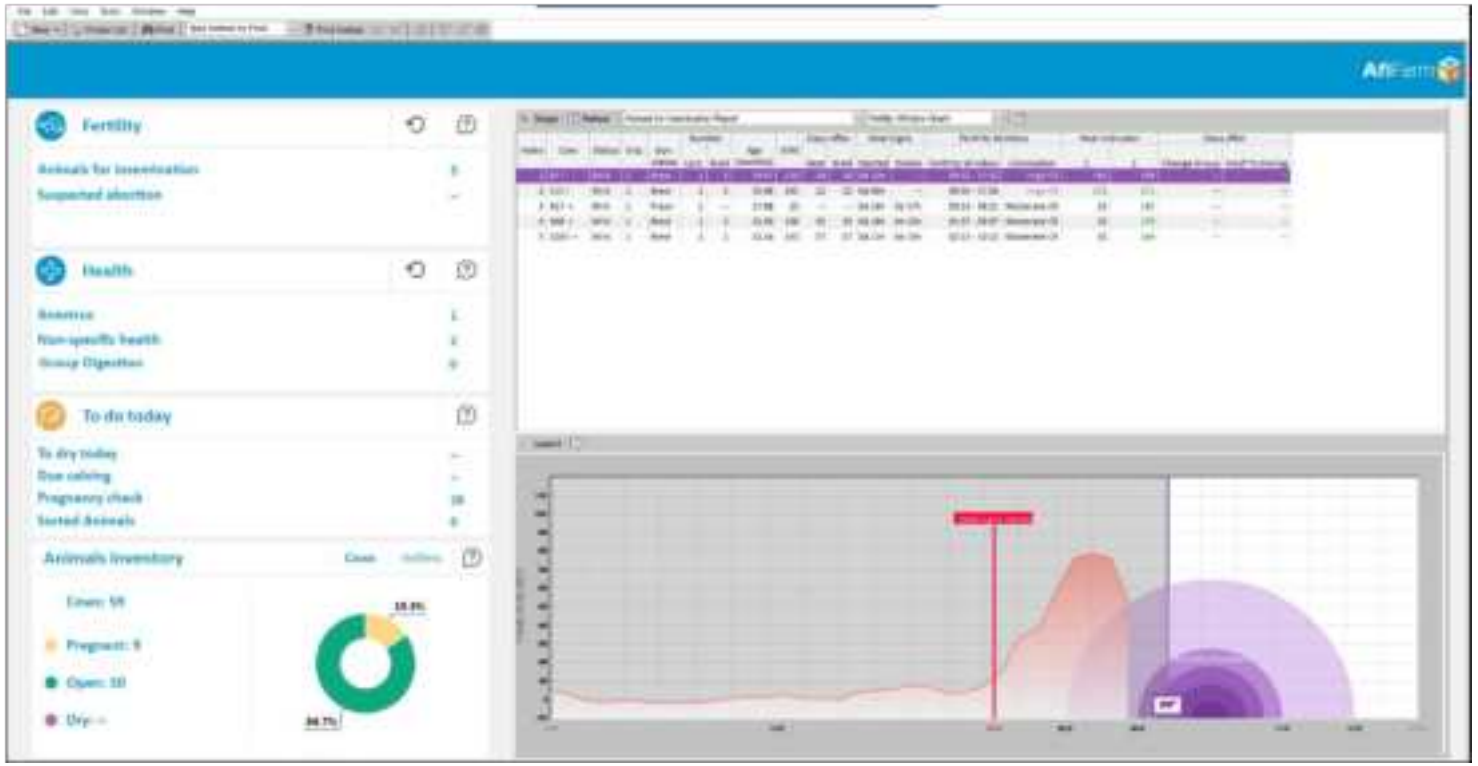
5 AfiCollar Based Reports

AfiFarm interprets the eating, rumination and motion data measured by the AfiCollar to provide a wide range of reports for managing the dairy farm.

Open AfiFarm ABC Dashboard (see below) to view new alerts and access detailed reports about fertility, health, and daily tasks (see AfiFarm ABC Dashboard User Guide).

The AfiFarm ABC Dashboard provides the following specific reports for AfiCollar users:

- **Non-Specific Health report** - lists animals that may be sick with undiagnosed health issues. (see Chapter 6).
- **Group Digestion report** - lists groups that may be experiencing feeding issues (see Chapter 7).



6 Identifying Possible Sick Cows

Identifying unwell cows is critical for quickly and effectively diagnosing and treating the issue and limiting its impact on the cow.

Healthy cows display stable eating and rumination behavior. Drastic changes to these aspects of a cow's behavior may indicate that she is unwell.

AfiFarm uses eating and rumination times measured by AfiCollar to indicate that such a change has occurred. These are reported in the **Non-Specific Health Report**, which provides alerts to animals that may be sick with an undefined issue.

Unlike other dedicated health reports, the Non-Specific Health Report does not specify the health issue; rather, it provides a warning to changes in an animal's normal eating/rumination routine, which may be caused by ill health.

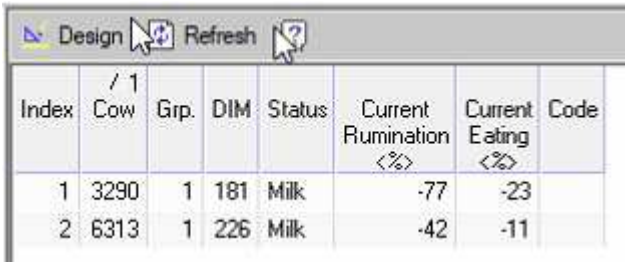
Use the report as a prompt to investigate the cow's wellness, and to take steps if sickness is suspected.

To view the Non-specific health report:

1. On the ABC Dashboard, under Health click **Non-specific health** report.

The Non-Specific Health report opens.

2. Click a row to open the detailed graph view of the cow's rumination/eating behavior and yield (see details below).



Index	/ 1 Cow	Grp.	DIM	Status	Current Rumination (%)	Current Eating (%)	Code
1	3290	1	181	Milk	-77	-23	
2	6313	1	226	Milk	-42	-11	

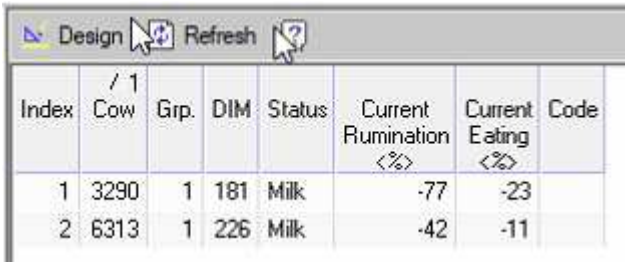
6.1 Understanding the Non-Specific Health Report

The Non-specific Health Report displays the following information:

- Detailed Report
- Graph

Detailed Report

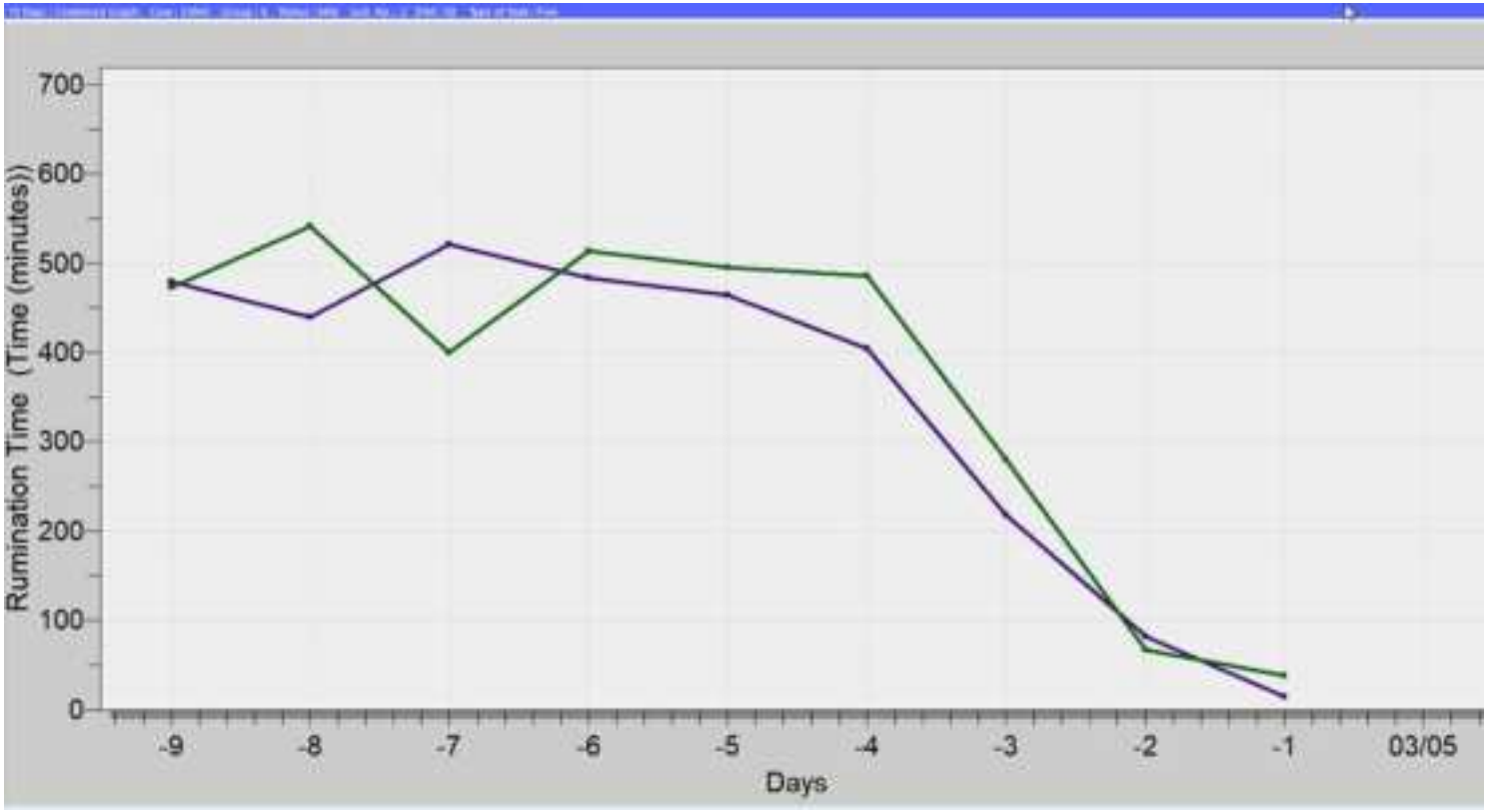
The Detailed Report displays the following:



Data	Description
Cow	Displays the cow number.
Grp.	Displays the group the cow is assigned to.
DIM	Displays the number of days the cow is in milk.
Status	Displays the current status of the cow as one of the following: • Milk • Dry • Heifer
Current Rumination (%)	Displays (in percentage) changes in rumination time, compared to the cow's normal rumination time for the last 24 hours.
Current Eating (%)	Displays (in percentage) changes in Eating time, compared to the cow's normal eating time for the same time of day (updated every hour).
Code	Displays the codes assigned to the cow on the Afimilk software.

Graph

Clicking a specific cow/row in the Detailed Report opens the following graph. The graph provides a visual overview of the relationship between health (as indicated by eating and rumination activity) and yield.



- **Purple Legend** – Accumulated daily rumination time.
- **Green Legend** – Accumulated daily eating time.

6.2 Setting Non-Specific Health Report Alert Thresholds

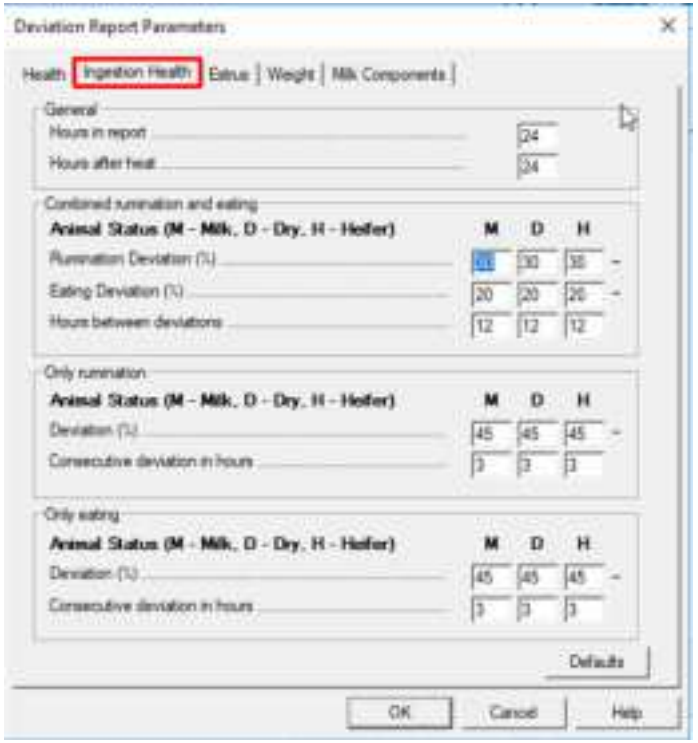
AfiFarm uses eating and rumination times measured by AfiCollar to indicate that a significant change in a cow's eating/rumination has occurred.

Increase or decrease the Non-Specific Health report thresholds to change its sensitivity and, consequently, the number of cows flagged with potential health issues, and included in the report as a result.

To configure deviation thresholds:

1. Open the Non-Specific Health report.
2. Click Design.

3. In the Deviation Report Parameters dialog box that opens, select the Ingestion Health tab.
4. Adjust the parameters to increase or decrease the thresholds, as required (see below).



The Non-Specific Health Report parameters are divided into the following:

- General,
- Combined Rumination and Eating,
- Only Rumination/Only Eating.

General

Data	Description
Hours in report	Sets the length of time the cow is displayed in the report after she no longer displays signs of illness.
Hours after heat	Sets the length of time, from when the cow starts to show signs of being in heat, that it will not be displayed in the report, even if it meets deviation requirements.

Combined Rumination and Eating

Data	Description
Rumination Deviation (%)	Rumination time deviation threshold.
Eating Deviation (%)	Eating time deviation threshold.
Hours between deviation	An alert is created if the hours between the decreased rumination and eating events exceed the set amount.

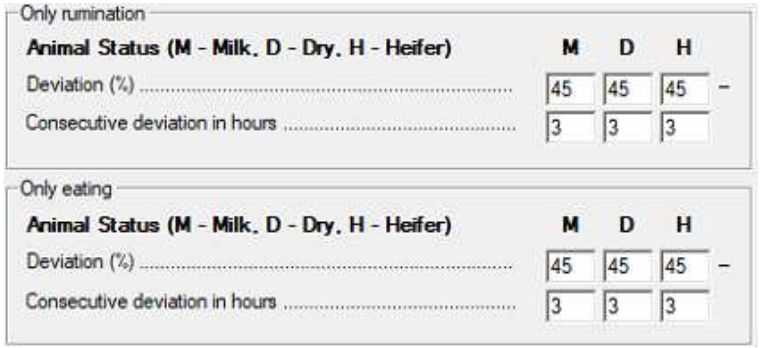
Note: To reduce the number of cows included in the report, increase the deviation percentages, and/or decrease the hours between deviations:

Larger deviation percentages = fewer cows included in the report.

Decreased hours between deviations = fewer cows included in the report.

Only Rumination/Only Eating

Higher deviation values for either one of the two parameters (rumination/eating) may also indicate a problem. This table allows you to include cows if only one of the parameters spikes.



Data	Description
Deviation (%)	Deviation threshold.
Consecutive deviation in hours	Sets the length of time (in consecutive hours) that the deviation must occur in order to include the cow in the report.

Note: To reduce the number of cows included in the report, increase the deviation percentages, and/or decrease the Consecutive deviation hours:

Larger deviation percentages = fewer cows included in the report.

Decrease the Consecutive deviation hours = fewer cows included in the report.

7 Identifying Group Feeding Problems

Eating and rumination are critical aspects of a dairy cow's life. Any deficit of this activity directly, or indirectly, indicates that a problem has occurred.

Rumination/eating deficits can occur for many reasons, some examples include:

- Late distribution of feed,
- Change in the size or composition of feed,
- Feed is out of reach,
- Defective/moldy feed.

AfiFarm uses eating and rumination times of a group, measured by AfiCollar, to indicate (directly or indirectly), that such a deficit has occurred. These are reported in the **Group Digestion** report, which provides alerts to groups that may have a feeding problem.

Each line in the report represents a group and its rumination and eating times.

Every substantial deficit at the group level is displayed in red. Use the report as a prompt to investigate what alterations to the group's nutritional regime may have caused the rumination or eating changes.

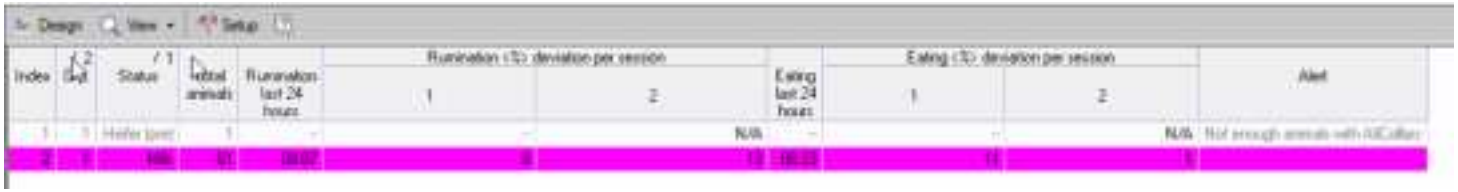
7.1 Viewing Group Digestion Report

A value in the Group Digestion line on the dashboard represents the number of groups with a Feed alert.

To view the Group Digestion Report:

1. On the ABC Dashboard, click **Group Digestion.**

The **Group Digestion** report opens.



2. Click a row to open the detailed report or graph view (see **Understanding the Group Digestion Report** below).

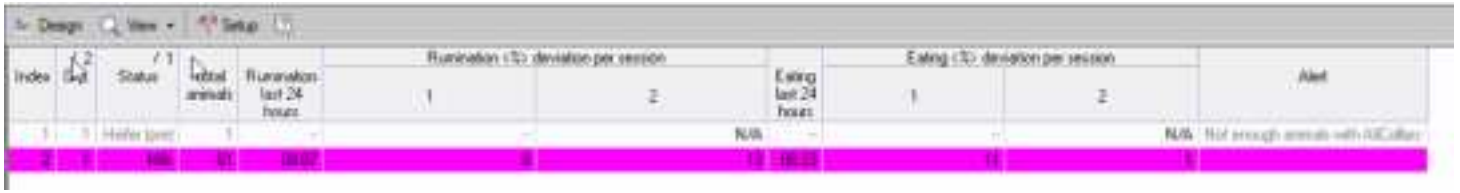
7.2 Understanding the Group Digestion Report

The **Group Digestion** report contains the following main elements:

- Group Digestion report,
- Detailed report/Graph view.

Group Digestion Report

The Group Digestion Report provides the following data for the last 24 hours:



Data	Description
Grp.	Displays the group analyzed for nutrition.
Status	Displays the current status of the group as one of the following: • Milk • Dry • Heifer
Total Animals	Displays the total number of animals in the group.
Rumination last 24 hours	Displays the total average rumination time for the group, for the last, finished daily sessions (usually 2 or 3). Displayed as HH:MM.
Rumination (%) deviation per session: 1/2/3	Displays the deviation percentage for the group, for each specific session.
Eating last 24 hours	Displays the total average eating time for the group for the last, finished daily sessions (usually 2 or 3). Displayed as HH:MM.

Eating (%) deviation per session: 1/2/3	Displays the deviation percentage for the group, for each specific session.
Alert	Displays one of the following alert types when a deviation is detected: • Decrease in rumination time or eating time. • Increase in rumination time or eating time. • Low daily rumination or eating time. • Data is not available or there is not enough data for the calculation.

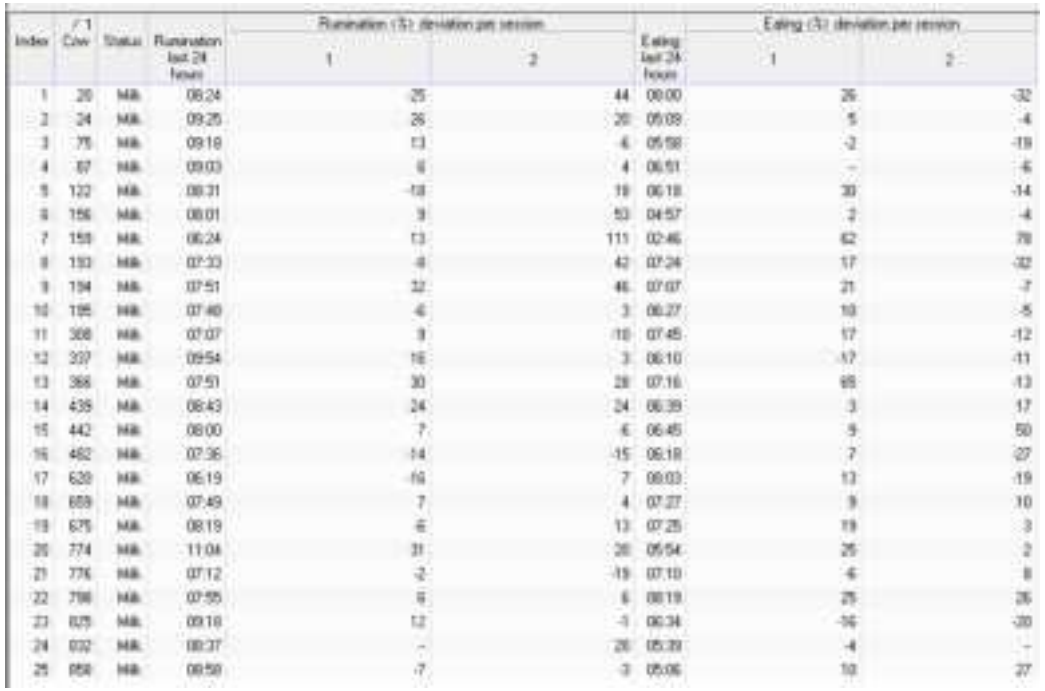
Detailed Report/Graph View

Clicking on a row in the top pane of the Group Digestion report opens the group's Detailed Report/Graph view below.

Click the View button to switch between the Graph and Report Views.

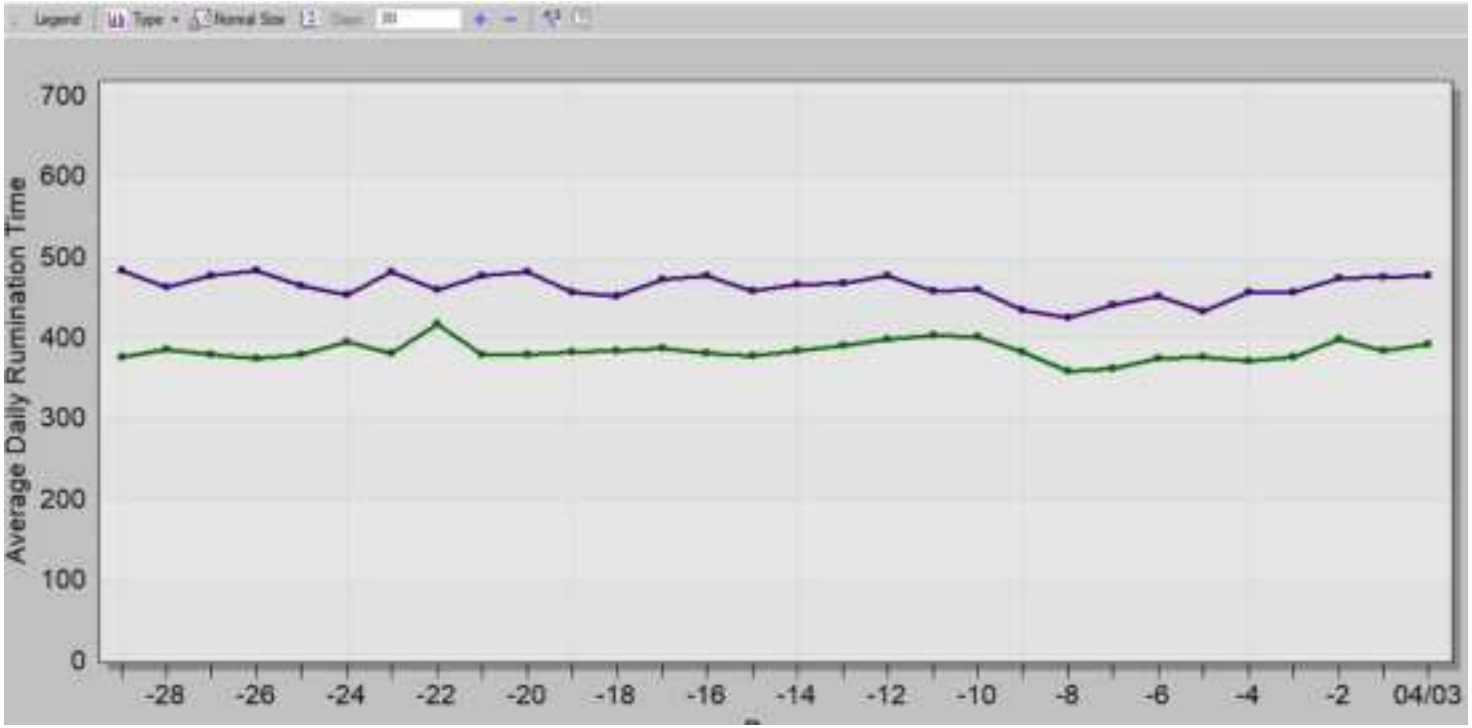
Detailed Report View

The Detailed Report view displays the rumination or eating deviation data for each cow in the group.



Graph View

The Graph View displays the daily eating and rumination times of the group over a set period (default = last 30 days).



The Graph view displays the rumination and eating times for the selected group as follows:

- **Green legend** – indicates the average daily eating time for the group.
- **Purple legend** – indicates the average daily rumination time for the group.

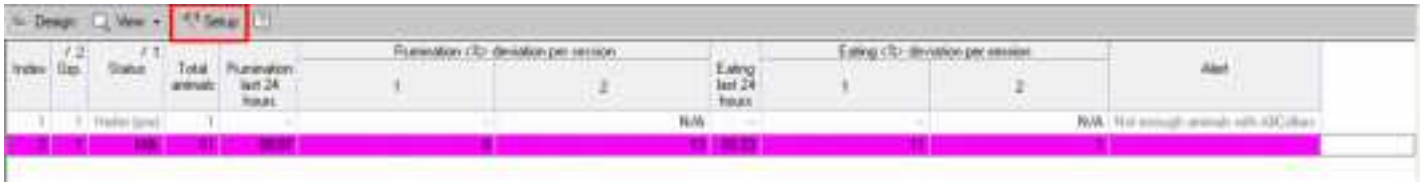
7.3 Setting Group Digestion Report Thresholds

AfiFarm uses eating and rumination times measured by AfiCollar to indicate, directly or indirectly, that a substantial change in eating/rumination has occurred at the group level.

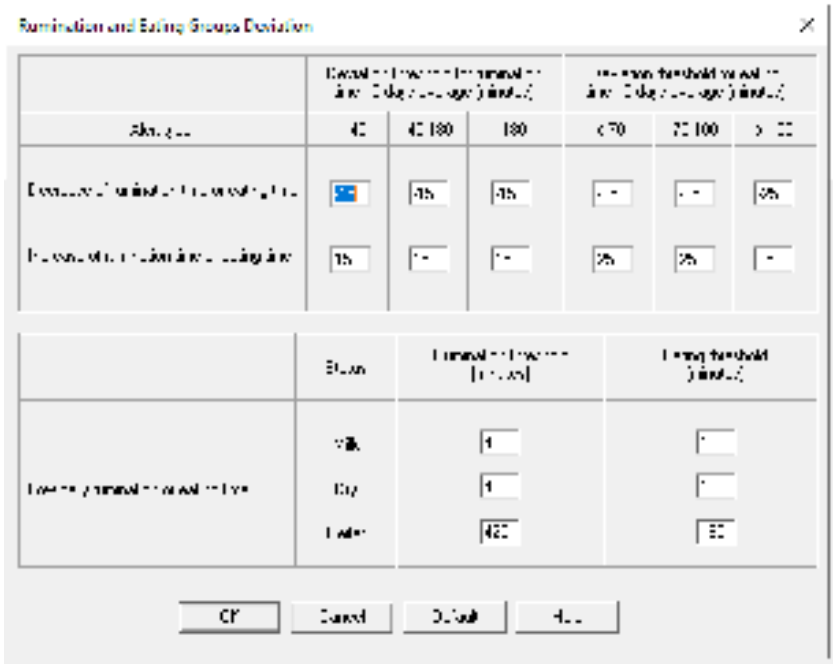
Increase or decrease the Group Digestion report thresholds to change its sensitivity and, consequently, the number of groups flagged with potential feeding issues, and included in the report.

To configure deviation thresholds:

1. Open the Non-Specific Health report.
2. Click **Setup**.



3. In the Rumination and Eating Groups Deviation dialog box that opens, adjust the parameters to increase or decrease the thresholds, as required (see below).



The Group Digestion Report parameters are divided into the following:

- Alert type,
- Low daily rumination or eating time.

Alert type

The Alert type is used to set the thresholds for creating an alert.

The Sensitivity of the report depends on the sessions times (minutes) of the group's rumination/eating:

- Increase the threshold for the alert level if the report is too sensitive – (it includes too many alerts [false positives]),
- Decrease the threshold for the alert level if the report fails to indicate a problem.

	Deviation threshold for rumination time 10 days average [minutes]			Deviation threshold for eating time 10 days average [minutes]		
Alert type	< 140	140-180	> 180	< 70	70-100	> 100
Decrease of rumination time or eating time	-15	-15	-15	-25	-25	-25
Increase of rumination time or eating time	15	15	15	25	25	25

Note: When the group's average rumination/eating time is shorter, a greater deviation threshold should be applied to accurately flag problems.

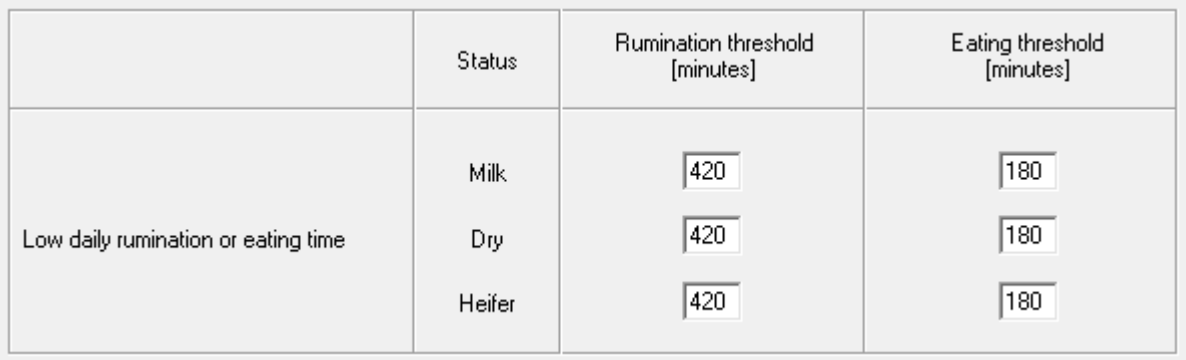
Note: When a group's average rumination/eating time is longer, smaller deviations are required to indicate that a problem exists.

Data	Description
Alert type (rumination)	Displays the following columns: **< 140** – upper and lower deviation thresholds for rumination times that are less than 140 minutes on average per group, for a particular session. **140-180** - upper and lower deviation thresholds for rumination times that are between 140 and 180 minutes on average per group, for a particular session. **> 180** - upper and lower deviation thresholds for rumination times that more than 180 minutes on average per group, for a particular session.

Data	Description
Alert type (eating)	Displays the following columns: **< 70** – upper and lower deviation thresholds for eating times that are less than 70 minutes on average per group, for a particular session. **70-100** - upper and lower deviation thresholds for eating times that are between 70 and 100 minutes on average per group, for a particular session. **> 100** - upper and lower deviation thresholds for eating times that more than 100 minutes on average per group, for a particular session.
Decrease rumination time or eating time	Sets the minimum percentage decrease for eating/rumination times. An alert is provided if the group's eating/rumination time decreases beyond this threshold.
Increase rumination time or eating time	Sets the maximum percentage increase for eating/rumination times. An alert is provided if the group's eating/rumination time exceeds this threshold.

Low daily rumination and eating time

Set the minimum amount of time for eating and rumination according to the group's status. If the time is less than this value, it appears red in the table and as an alert on the dashboard.



8 Troubleshooting

Problem	Indication	Suggested Solution
Reader is not receiving any collar messages.	• Status LED is blinking • PC COM LED is ON • No new messages appear for collars in AfiControl	1. Verify (with Afimilk coverage test tool) that collars are in the covered area of the reader for more than 15 minutes. 2. Verify working channel is set correctly according to your region in Aficontrol 3. Verify the reader firmware version is the latest released with the official afifarm 5.4.
Rumination/Eating/Motion data from collars looks strange.	10 Days graph reflects abnormal or strange activity that is inconsistent with the animal's actual activity.	Verify the collar is mounted on the animal neck as instructed in the manual.
All other problems		Please open a service call for Afimilk support team: support@afimilk.com

9 Certification and Licensing

FCC Statements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING – RF EXPOSURE COMPLIANCE: This equipment should be installed and operated with a minimum distance 20cm between the radiator and your body.

- This Class B digital apparatus complies with Canadian ICES-003.
- Cet appareil numerique de la classe B est conforme a la norme NMB-003 du Canada.

IC Statements

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) L'appareil ne doit pas produire de brouillage;

2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

AVERTISSEMENT – CONFORMITÉ AUX NORMES D'EXPOSITION AUX RF : Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps.

afimilk

EC DECLARATION OF CONFORMITY

Manufacturer:	**afimilk® Agricultural Cooperative Ltd.**		
Address:	Kibbutz Afikim 1514800		
Country:	ISRAEL		
Phone:	+972-4-6754812	Fax:	+972-4-6751862

Product(s):	**AfiCollar**		
	ID Collar Tag	P.N:	8002030 (8002031)
	Interfaces with		
	AfiAct II Reader	P.N:	4256205

We declare under our sole responsibility that our product(s) mentioned above, conform to the relevant European Union harmonized legislation:

EMC	(2014/30/EU)
RED	(2014/53/EU)
RoHS	(2011/65/EU)

Conformity was achieved by compliance to the following standards:

Requirement	Standard	Version	Year	Ref.
EMC	EN 301 489-1	V2.2.0	2017	AFIEMC_EN.33571
	EN 301 489-3	V2.2.1	2019	AFIEMC_EN.33571
	EN 300 220-2	V3.2.1	2018	AFIRAD_EN.300220.33571
	EN 300 330	V2.2.1	2017	AFIRAD_EN.300330.33571
CE	affixed on	AfiCollar Tag		01/11/2019

The authorized representative within the EC is:

NUTRISERVICE SRL

Via dello Strone n8/a, 25020 San Paolo (Brescia)

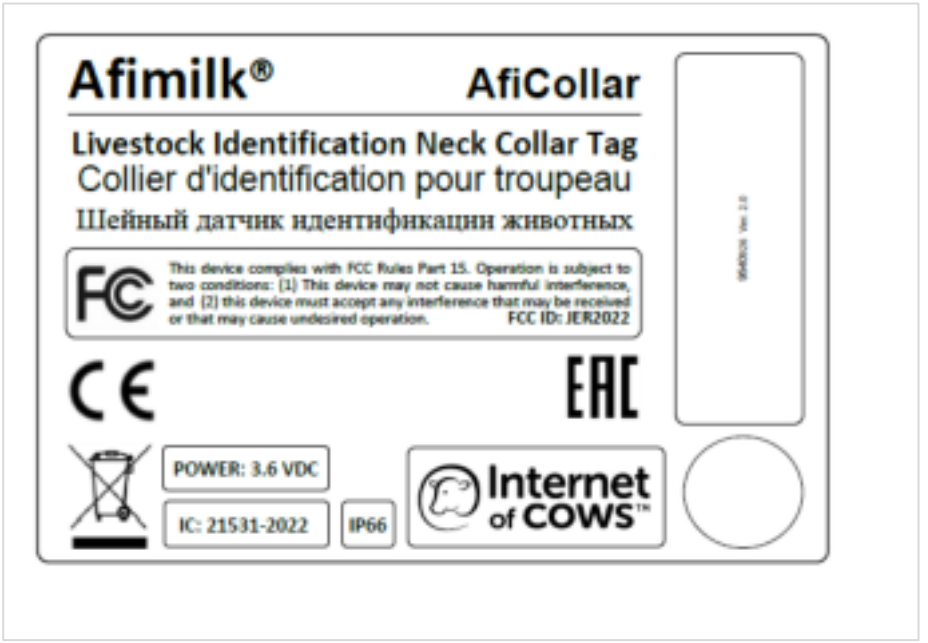
Tel. + 39.030.9979331 Fax +39.030.9970035

Afimilk Rep.:

Ehe Shimshon, Regulatory Officer

Date of issue: 01/11/2019

Place of issue: Kibbutz Afikim, ISRAEL



afimilk®
Automating dairy farms

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