

An Introduction to the Connected Cow

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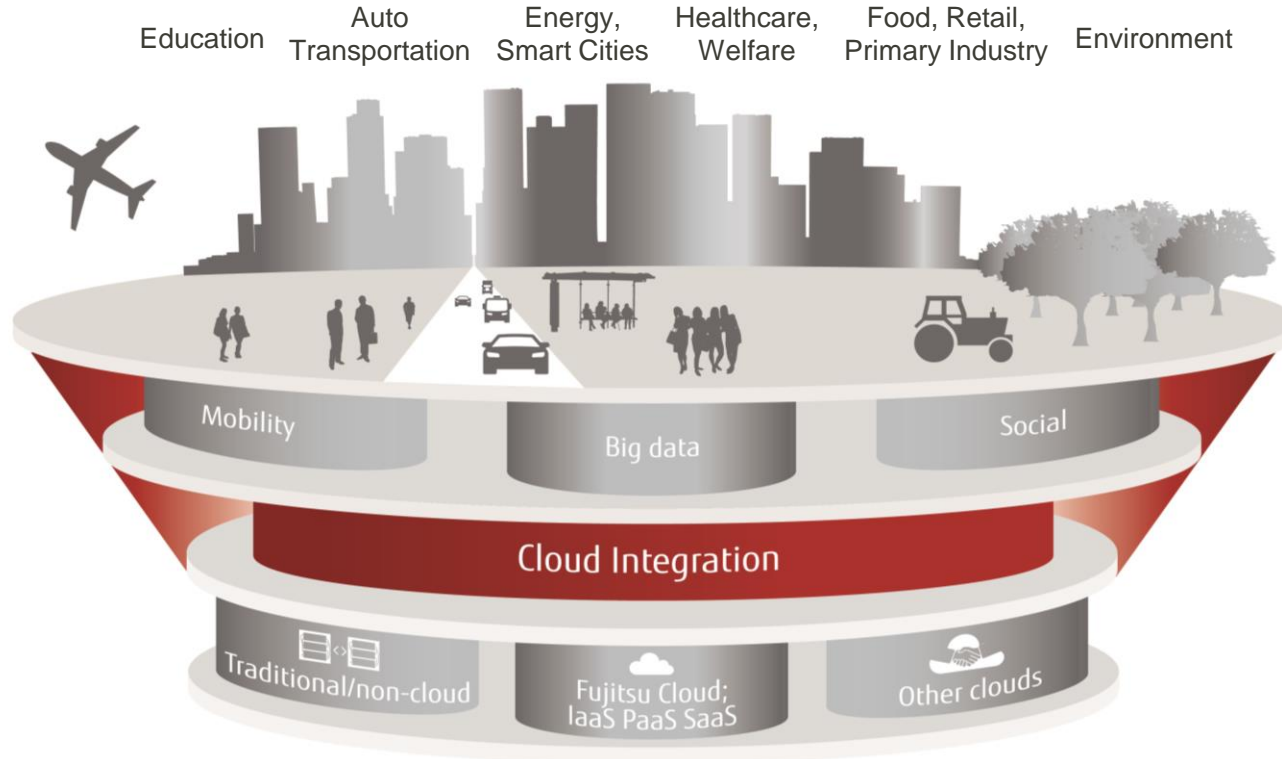
shaping tomorrow with you

Human Centric Innovation in Action



Human Centric Intelligent Society

- A new type of society where people's lives are enriched by ICT and innovation is everywhere, delivering new business and social value



One-stop ICT solutions by Fujitsu's Food & Agriculture Cloud



* **“Aki”** means “Autumn” : stands for the best timing of harvest
“Sai” means “various colors” : stands for the color of fruits and vegetables

Connected Cows

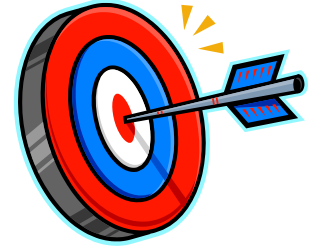
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Estrus Detection System for Cows

GYUHO™ SaaS



- Increasing market demand for effective production
- Increasing feeding cost
- Increasing impact of diseases
 - BSE
 - Foot diseases
 - Mouth diseases
- Decreasing prices of food
- Availability of relatively cheap, imported meat

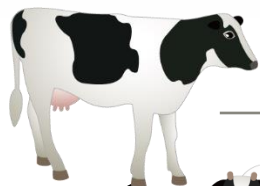


- Reduce cost of production
- Increase milk production
- Increase head-count of the herd
- Shorten return-of-investment for new IT solutions implemented

- A system that efficiently increases cattle yield by detecting estrus, based on changes in cow's behavior patterns.
- The main advantages of this system include:
 - ✓ Recognition of the best timing for insemination by detecting estrus.
 - ✓ Early detection of conception as well as due date prediction becomes possible according to the state of estrus after insemination.
 - ✓ Notifications can be received at any time and any place.

System Overview

Farm



Sending data every hour from pedometer within 150m radius from receiver



1. Sending steps data



Pedometer

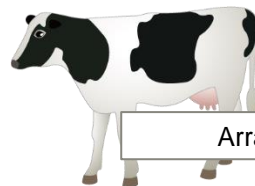
2. Automatically sending feedback information to mobilephone/smartphone etc.



Farmer



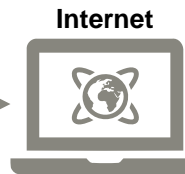
3. Confirming detailed information on PC



Arranging insemination

Data center

- Putting together every farmer's information
- Production planning



Receiving steps information

Microsoft Azure

Fujitsu estrus info



Device overview

■ Pedometer

- ✓ Waterproof and dustproof structure in a completely sealed
- ✓ Size: W 78.0 x D 71.5 x H 29.0
- ✓ Weight: approx 120g

■ Receiver

- ✓ Size: W 65.0 x D 41.0 x H 105.5
- ✓ Weight: approx 270g



Pedomete

Receiver

Activity Monitoring

Stock Farm Selection
demo-001

Headcount in list 249 head

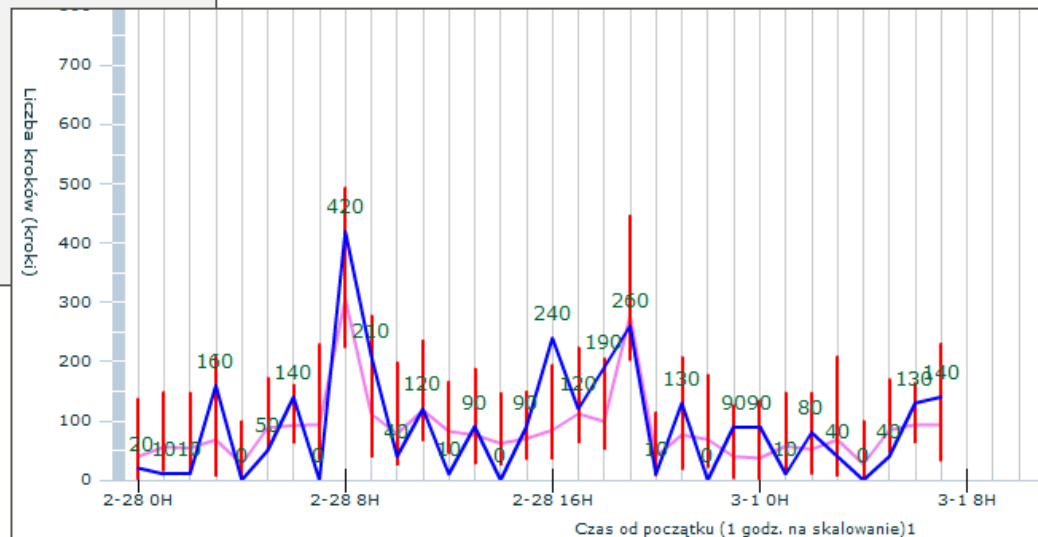
Print

Legend

Cow to be fresh-checked	: Fresh-check	Cow expected to calve	: Expected to calve
Anestrus cow	: Anestrus	Expected dry cow	: Expected dry
Non-inseminated cow	: Non-inseminated	Cow to be checked for estrus	: Check estrus
Cow to be pregnancy tested	: Preg test	Cow eligible for AI	: Eligible for AI

Fresh Check	15Day
Voluntary Waiting Period (VWP)	40Day
Target days until first AI	80Day
Scheduled No. of Pregnancy Test Days	45Day

No.	Individual ID▲	Stepcounter Number	Fresh-check	Non-inseminated	Expected to calve	Check estrus	Date of birth	Last AI Date	← Lapsed time No. of days	Previous estrus start date	Expected dry-off date
			Anestrus	Preg test	Expected dry	Eligible for AI	Calving	Last Calving Date	← Lapsed time No. of days	Scheduled Date of Next Estrus	Expected calving date
1	1 Graph List	0038		o	2006-09-24	2012-03-27	742	2012-03-27	-		
					4	2011-10-07	914	-	2013-01-06		
2	101 Graph List	-		o	2006-09-24	2011-12-22	838	2011-12-22	-		
					3	2011-11-05	885	-	2012-10-02		
3	102 Graph List	-		o	2006-10-01	2012-06-02	675	2012-06-02	-		
					4	2011-12-06	854	2014-04-26	-		
4	103 Graph List	-		o	2006-09-12	2012-04-06	732	2012-04-06	-		
					3	2012-01-01	828	-	2013-01-16		
5	104 Graph List	0072		o	2006-10-10	2012-03-11	758	2012-03-11	-		
					4	2011-12-23	837	-	2012-12-21		
6	106 Graph List	0054		o	2006-09-29	2012-05-21	687	2012-05-21	-		
					4	2012-03-22	747	2014-04-14	-		



Farm Management

Farm

Business

Alert

Individual and Breeding Information

Cow Calendar

Registered Cows

Registered Cattle Work List

Pedometer

Attachment/Removal

List of Removed Cows

Herd Settings

CSV Download

Registered Cows

Statistics

First AI

JMR (Average days late)

Conception Rate and Calving Interval

Conception Rate Verification

Birth Sex Ratio

Summary of Removed Cows

Default Settings

Default Settings

Master Management

Stock Farm Selection: demo-001

Register Update Print Show all breeding information

Search condition: Search by cow name (selected)

Fuzzy search: [] Search

Initial character search: N0000215

Cow Information displayed: Individual ID: O00215, Date of birth: 2008-08-16, Current no. of calvings: 4, Last Calving Date: 2012-07-27

Calving: Calving, Calving date

Nulliparous: 4, 2012-07-27

Attached Step: Stock Farm Selection demo-001

2013-03

Attachment of Stepcounter Planned	Calving Planned	Estrus Planned	Pregnancy Test Planned	Nonlactation Planned
Sun	Mon	Tue	Wed	Thu
				1
				2
3	4	5	6	7
				8
				9
10	11	12	13	14
				15
				16
17	18	19	20	21
				22
				23
24	25	26	27	28
				29
				30
31				

No.	Plan ▲	Actual date	Individual ID
1	Calving	2013-03-07	Not Found
2	Calving	2013-02-25	Not Found
3	Calving	2013-02-22	Not Found
4	Calving	2013-03-05	Not Found
5	Calving	2013-03-04	Not Found
6	Calving	2013-02-27	Not Found
7	Calving	2013-02-22	Not Found
8	Calving	2013-03-07	Not Found
9	Calving	2013-03-05	Not Found
10	Estrus	2013-03-02	Not Found
11	Estrus	2013-03-02	Not Found
12	Estrus	2013-03-02	Not Found

Individual Information

Individual

Cow name	N0000215
Individual ID No.	D000000215
Ear tag	E0215
Herd Test No.	A0000215
Other (Assoc. No./Bam Name)	O00215
Date of birth	2008-08-16

Genetic Information

Sire	FM002	Cow name
Dam		
Dam's sire	MFM010	
Damsire	MGM023	

Introduction to Herd (if cow purchased)

Introduction date	
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Farm	Breeding Numbers	Before Gyuho Intrapartum Interval	After Guyho Intrapartum Interval	Interval Decrease # of days	Increased Heads	%
A	180	363	348	15	8	4.4%
B	262	359	344	15	12	4.6%
C	110	377	351	26	8	7.3%
D	202	339	330	9	6	3.0%
E	498	363	336	27	40	8.0%
F	201	439	359	80	37	18.4%
G	537	400	347	53	75	14.0%
H	273	502	351	151	85	31.1%
I	173	422	352	70	29	16.8%
J	248	368	335	33	24	9.7%
K	151	387	354	33	13	8.6%
Mean	258	393	348	47	31	11.4%
Std Dev		46.6	9.0			

- **Based on the data analysed from 11 reference farms GYUHO solution improved predictability by 500%**
- **Reduced interval by 47 days**
- **Increased productivity by 11%**

The effect of the introduction in Japan

- ◆ It became possible to detect estrus in 1,150 cows with less manpower, and production milk yield increased.
- ◆ Average insemination success was improved to 1.58 attempts from 2.0–2.5 attempts.



The effect of the introduction in Korea

- ◆ Average calving interval was shortened to 354 days from 402 days.
- ◆ Female cattle birth ratio was increased.
 - ✓ As a result, an increase of USD 645 per head per year is expected.

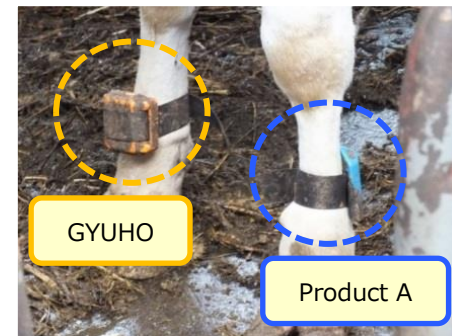


◆ Compared to other products for estrus detection, GYUHO achieved the following results.

1st Farm: GYUHO 98.4%, “Product A” 91.9%


2nd Farm: GYUHO 98.3%, “Product A” 96.7%

◆ GYUHO provides real time monitoring and notifications, but “Product A” collects data only 2–3 times per day.



GYUHO SaaS can help livestock farmers





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