

# iDDEN – International Dairy Data Exchange Network

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Based partly on slides by Reinhard Reents

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# Content of the Presentation



- Nordic Cattle Data Exchange as basis of iDDEN
- What is iDDEN and what they are doing?
- Breeding perspective
  - What are the possibilities from a breeding perspective?
  - Road map to make data available for dairy cattle breeding including a suggestion for priority

# Nordic Cattle Data Exchange as basis of iDDEN



## Nordic Cattle Data Exchange as basis of iDDEN

**NCDX is an interface service and an information exchange standard that solves the common problem between farms, milk recording and milking robot and parlor providers: How to exchange information faster, more easily and more cost effectively.**

- NCDX's development began in 2013 and was completed in November 2015. The development and maintenance done by Mtech (Finland)
- NCDX:n was developed together with the key milk recording and breeding organizations from Finland (Mtech (ProAgria and Faba)), Sweden (Växa Sverige), Denmark (Seges) and Norway (Tine). Iceland (RML) joined the co-operation 2016
- Today agreements with the two largest FMS's in Scandinavia
  - Lely Scandinavia (since 2017)
  - Delaval (in process of starting to use)
- Used by more than one thousands farms with numbers growing every day

# NCDX in nutshell



- NCDX is an interface solution which provides uniform, one interface as a superset of countries' needs and enables solution providers to connect to it (and through it to different national data sources)
- In the NCDX following tasks could be done (two-way transfer)
  - Send movement/transfer in/out from FMS
  - Send feed intake from FMS
  - Send milking / complex milking from FMS
  - Send body condition score from FMS
  - Send drying offs from FMS
  - Send heats from FMS
  - Send inseminations from FMS
  - Send live weights from FMS
  - Send calvings from FMS
  - Send pregnancy checks from FMS
  - Receive movement/transfer out/in to FMS
  - Receive milk analysis result to FMS
  - Receive available identities to FMS
  - Receive national codesets to FMS
  - Receive drying offs to FMS
  - Receive heats to FMS
  - Receive herd feed stuff to FMS
  - Receive initial herd dataset to FMS
  - Receive inseminations to FMS
  - Receive milk analyses to FMS
  - Receive calvings to FMS
  - Receive pregnancy checks to FMS
  - Support national authentication and authorization

# Nordic Cattle Data Exchange as basis of iDDEN



## What is iDDEN and what they are doing?

# Why iDDEN



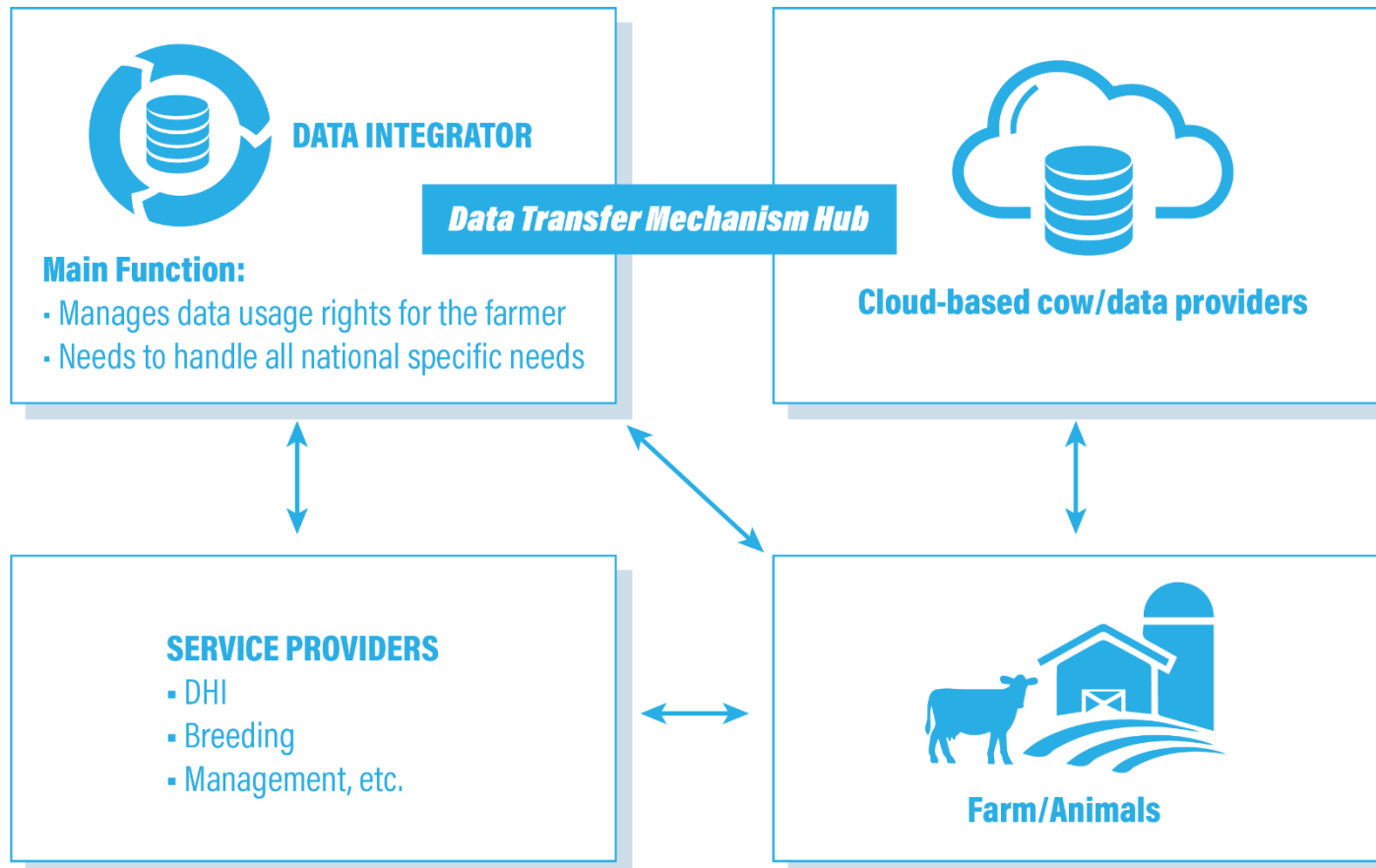
- Digitalization on farms
- Numerous new ways of collecting data on farms
  - Mainly sensors
- More data from traditional milk samples
  - MIR spectral data
- More information from genomic evaluation
  - Increasingly used on farm for breeding and management
- Many national and company specific interfaces and data exchange mechanisms

**The International Dairy Data Exchange Network enables the common exchange of these different data sources in an efficient manner**

A data exchange/interface service between global dairy equipment manufacturers and dairy industry members located around the world

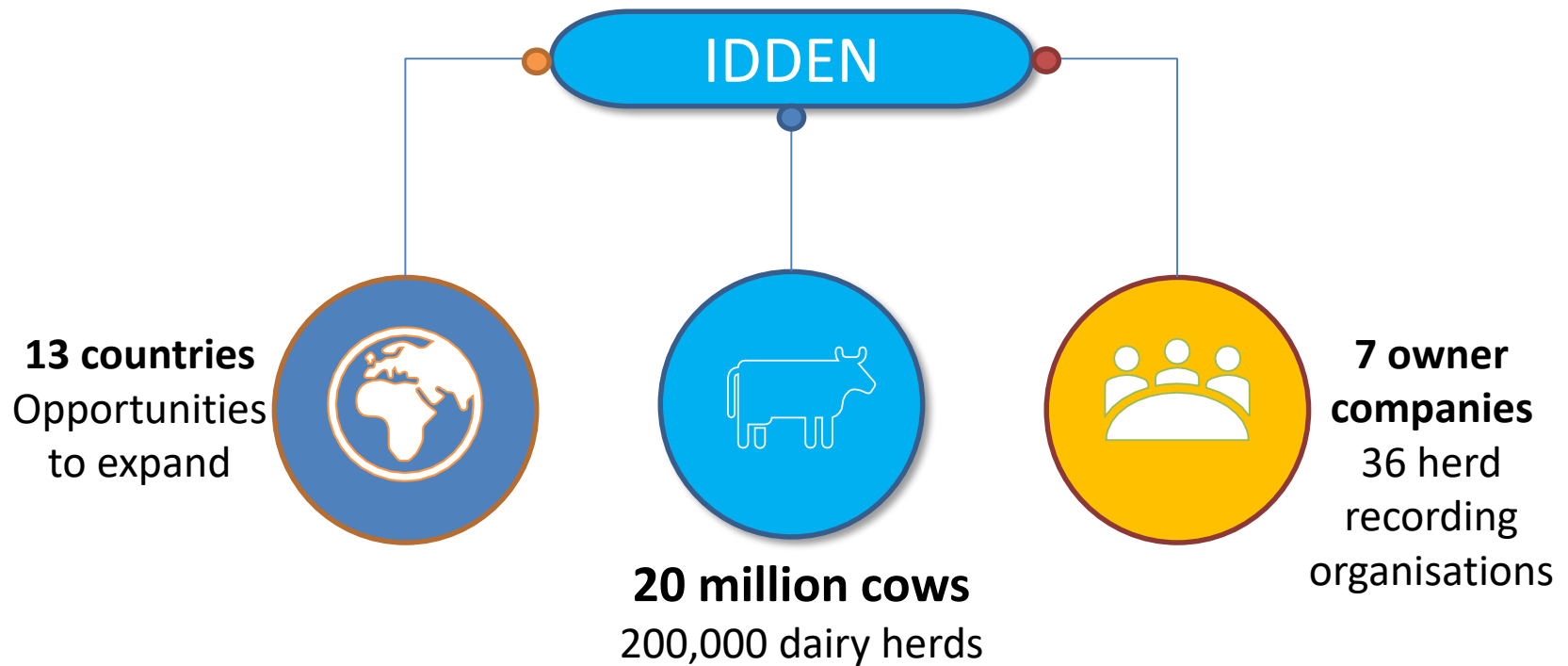


### Schematic of data flow between on-farm data and other (central) data





# Worldwide Potential

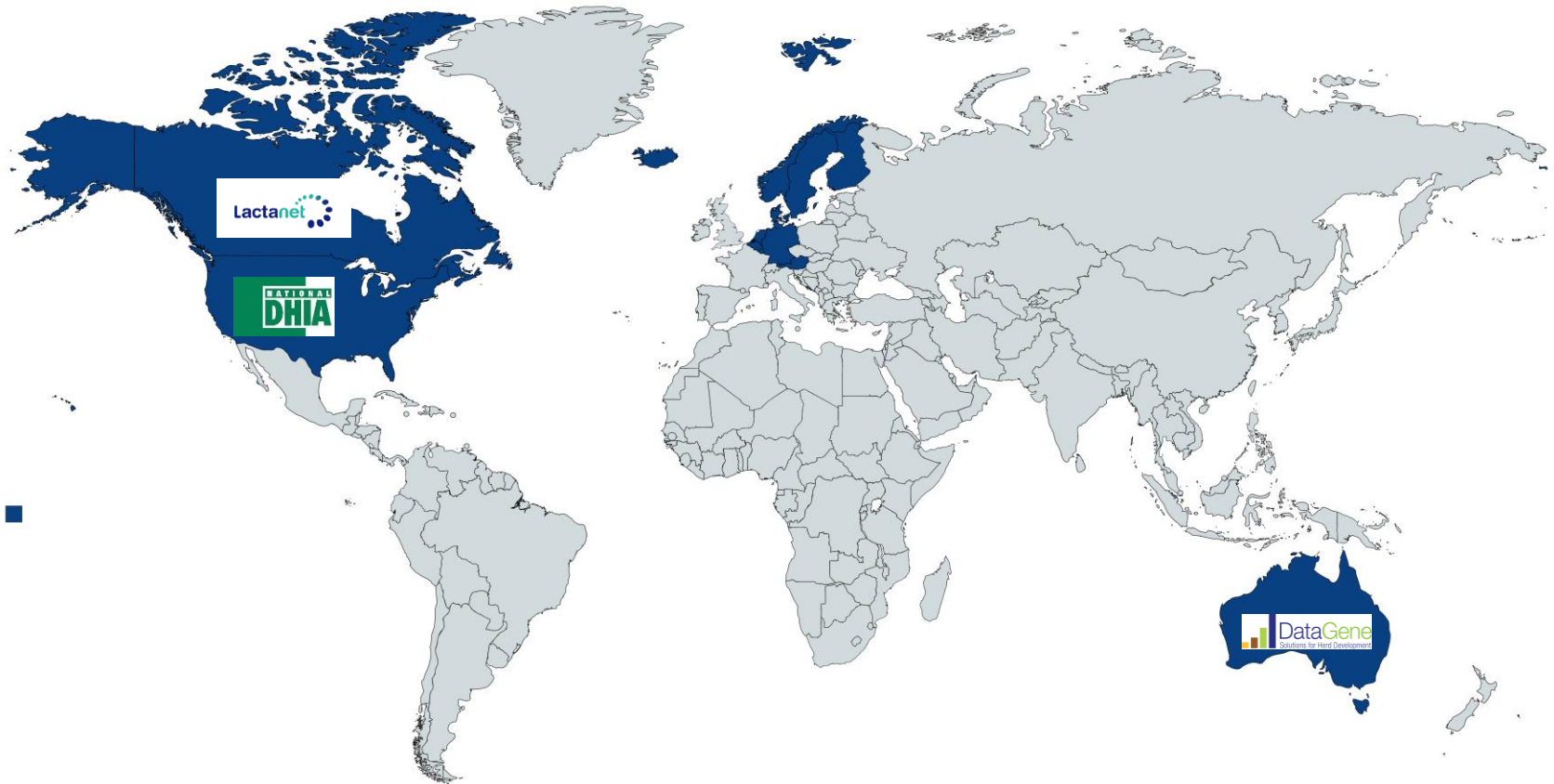


# Current owners/shareholders



- Shareholder
  - CRV The Netherlands & Belgium
  - Data Gene Australia
  - Lactanet Canada
  - NDHIA USA
  - NCDX ApS Den, Ice, Fin, Nor, Swe
  - RDV Austria, Germany
  - vit Germany, Luxemburg
- iDDEN has been created as a GmbH under German law on May 6, 2020, acting CEO → Reinhard Reents

# Current shareholders



Created with mapchart.net

# Current shareholders



Created with mapchart.net

# Users of the system



- iDDEN offers its service for further MROs or computing centres advantages:
  - Usage of an up to date data transfer system (hub)
  - Shareholders of iDDEN make sure, that there is a constant development and inclusion of new standards and new data transfer mechanism
  - iDDEN operates as a Non for Profit Organisation, therefore likely a cost effective system in the long run
- iDDEN is open for all OEMs and also FMS
  - Same advantages as for MROs
- In General: the use of standardized interfaces and standardized data transfer mechanism will significantly reduce current costs for
  - transformation of data from different standards
  - Costs of redundant hubs
  - Non usage of data that is available

# How to get users on the system?



- All MROs within iDDEN are expected to join
- 3 MROs outside iDDEN has contacted iDDEN after the Press release about possibilities to join the system
- iDDEN is open for all OEMs and also FMS
  - One milking equipment company has started their integration
  - One starts up in January 2021
  - One is still in negotiation phase
  - More will be contacted as soon as iDDEN is ready to include more
- In General, we expect that it will be beneficial to join iDDEN, and with the biggest stakeholders more will join

# Technical implementation



- Purchase of the NCDX solution from the NCDX group
- Expansion of the current solution to handle also cloud based repositories of data
- Implementation of the ICAR ADE standard
- Contract between iDDEN GmbH and Mtech (Finland) to house, expand and maintain the iDDEN system

# ADE Messages / Examples



- Repository of all ADE Message development
  - <https://github.com/adewg/ICAR>
- Example Message Scheme
  - <https://raw.githubusercontent.com/adewg/ICAR/master/url-schemes/exampleUrlScheme.json>
- Editor for Swagger (Open API)
  - <https://editor.swagger.io/>
- Direct Link
  - <http://editor.swagger.io/?url=https://raw.githubusercontent.com/adewg/ICAR/master/url-schemes/exampleUrlScheme.json>



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## Questions on NCDX, iDDEN ?

# Nordic Cattle Data Exchange as basis of iDDEN



## Breeding perspective

# What are the possibilities from a breeding perspective?



- Opportunities
  - More data sources
  - More equipment / more companies
  - More updated data
  - New data – new possibilities
  - Most Nordic dairy farms have a high-level technology
- Challenges
  - Still depending on the willingness from providers of on farm equipment suppliers (“milk” – “Feeding” – “Sensors”)
  - Competition with (other) management equipment
  - Not supported older version of the on-farm equipment software

# Messages / Data items for iDDEN



	Message	Description	Priority
<b>0</b>	login	Login to MRO or cloud provider	0
<b>1</b>	milking-visits-simple	Individual milkings collected by the milking machine	1
<b>2</b>	milking-visits-complex	Individual milkings collected by the milking machine plus additional sensor data	1
<b>3</b>	milking-quarter-data	teat-coordinates, milk weights, milking time	1
<b>4</b>	herd-list	list of in herd animals	1
<b>5</b>	mpr-test-day-result	test day milking result (includes lab result)	2
<b>6</b>	birth	I&R, births	2
<b>7</b>	death	I&R, deaths	2
<b>8</b>	arrival	I&R, arrivals	2
<b>9</b>	departure	I&R, departures	2
<b>10</b>	still-birth	I&R, still births	2
<b>11</b>	Insemination	insemination event	3
<b>12</b>	natural-service	natural service event	3
<b>13</b>	device-data	Information on the devices on the farm	3

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# Messages / Data items for iDDEN - II



	Message	Description	Priority
14	drying-off	drying-off event	3
15	pregnancy-check	pregnancy check result (pregnant, not pregnant, doubt)	3
16	abortion	abortion event	3
17	parturition	calving date, parity, birth progress, particularities	3
18	running with a bull	running with a bull event	3
19	keep-open	cow will not be impregnated again	3
20	mpr-lactation	lactation milking result	4
21	mpr lifetimeprod	life time milking result	4
22	mpr-herd-milking-result	herd milking result	4
23	grazing	Daily Grazing of Herd Summary	4
24	heat-report	actual report – attentions	4
25	heat-activities	graph data, steps, rumination	4
26	health-report	actual report – attentions	4
27	health-activities	graph data, walking, standing, lying, ...	4
28	treatments	medical treatments, medicines, diagnosis	4

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19	keep-open	cow will not be impregnated again	3
20	mpr-lactation	lactation milking result	4
21	mpr-lifetimeprod	life time milking result	4
22	mpr-herd-milking-result	herd milking result	4
23	grazing	Daily Grazing of Herd Summary	4
24	heat-report	actual report – attentions	4
25	heat-activities	graph data, steps, rumination	4
26	health-report	actual report – attentions	4
27	health-activities	graph data, walking, standing, lying, ...	4
28	treatments	medical treatments, medicines, diagnosis	4

# What are the possibilities from a breeding perspective?

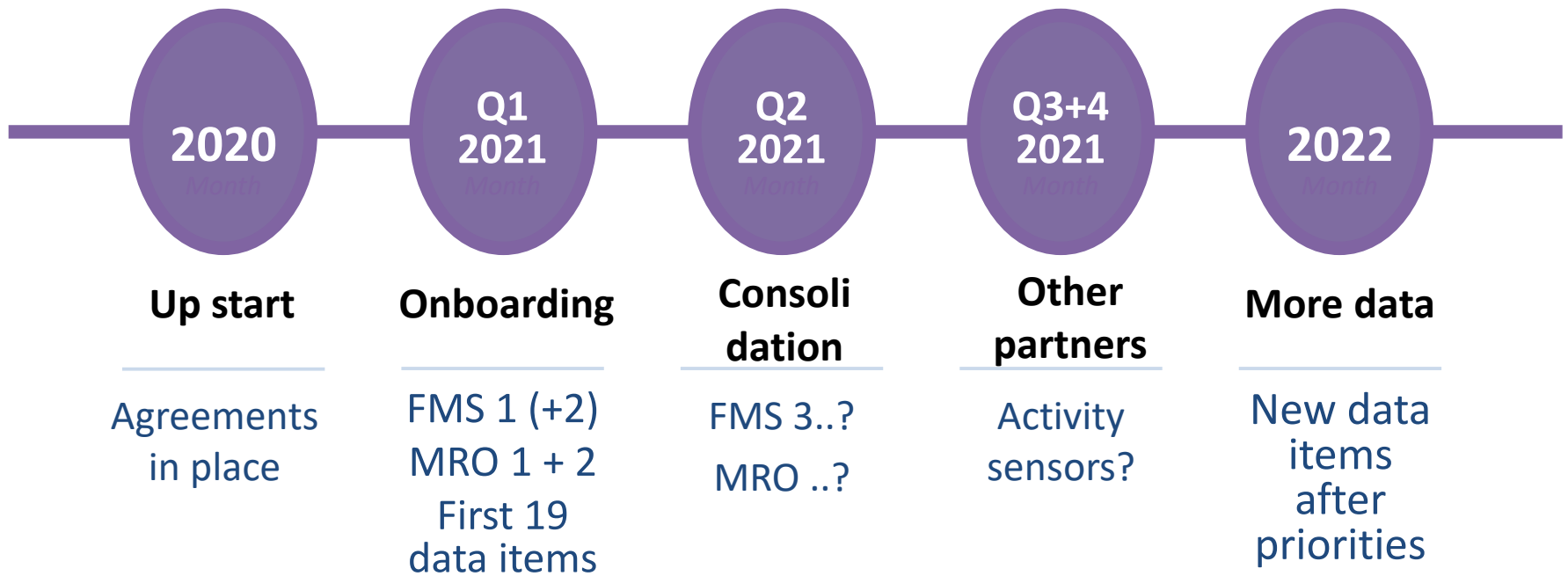


- Can we find new data out there for breeding evaluation?

Weight	Weight cells in AMS systems	Not very normal
	Weighing equipment in the barn	
Milk speed	Most milking equipment	Already covered?
Feed uptake (concentrate)	AMS and feed stations	Value?
Rumination	Activity sensors	Value?
Laying time	Activity sensors	Value?
Other sensor data	?	?



# Road map to make data available for dairy cattle breeding including a suggestion for priority



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## Discussion on Breeding Perspective

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**Thank you**