Cooperative Resources International

美国国际资源育种公司

Introduction and Advantages

公司介绍及优势

CRI Headquarters

Shawano, Wisconsin

总部位于威斯康辛州莎瓦诺市

Size and Scope 规模和结构

Genex
Cooperative, Inc.
A Subsidiary of Cooperative Resources International

AgSource
Cooperative Services
A Subsidiary of Cooperative Resources International

mofa®

Central Livestock Association

Genex
Farm Systems
A Division of Genex Cooperative, Inc.

Core Business 核心业务

- Artificial reproduction products for AI and ET in pigs, cattle, horses, dogs, small ruminants
  猪、牛、马、犬、羊等动物人工授精和胚胎移植所需的繁殖产品
- Advanced reproductive commercial services
  高端繁殖服务
- Biomedical model development and production
  生物医学模型的研发和生产
- Cell biology – ibidi subsidiary 细胞生物学
- Stem cell products – VitaeCell 干细胞产品

Research 科研

Inaugurated multi-species research and service facility, the International Center for Biotechnology, in Mount Horeb in 2004.
2004年落成的国际生物技术中心，提供多方面的科研和服务

mofa™

MOFA Global Manufacturing Facilities

MOFA产品制造工厂

Verona, Wisconsin, USA 美国威斯康辛州维罗纳

Co-Extrusion Line for
Production of AI catheters

Blow Molding Production
for plastic semen tubes
Annual capacity: 55mio

Size and Scope 规模和结构

International Marketing
国际市场
Finance & Information Tech 财政和信息技术
Human Resources
人力资源
Information & PR
信息和公共关系
Business Development
商务拓展

Genex
Cooperative, Inc.
A Subsidiary of Cooperative Resources International

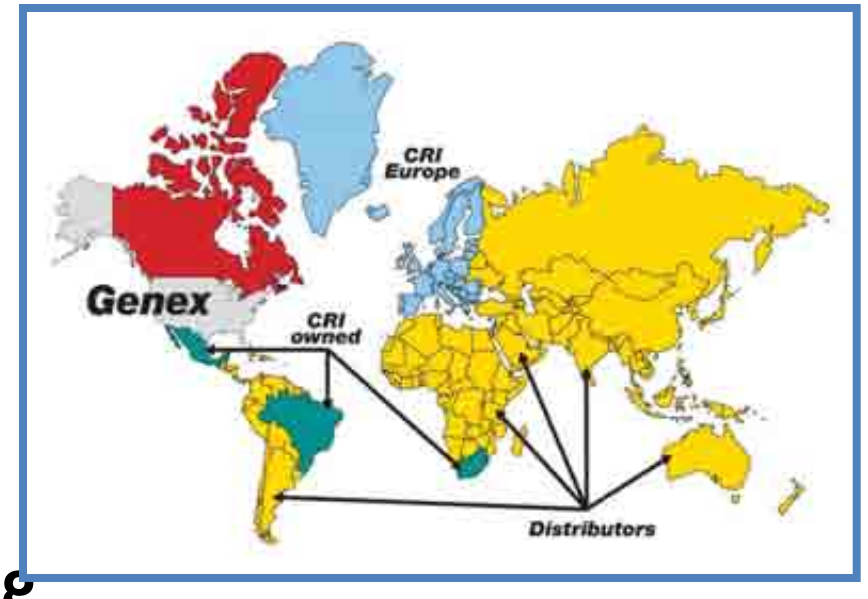
AgSource
Cooperative Services
A Subsidiary of Cooperative Resources International

mofa®

Central Livestock Association

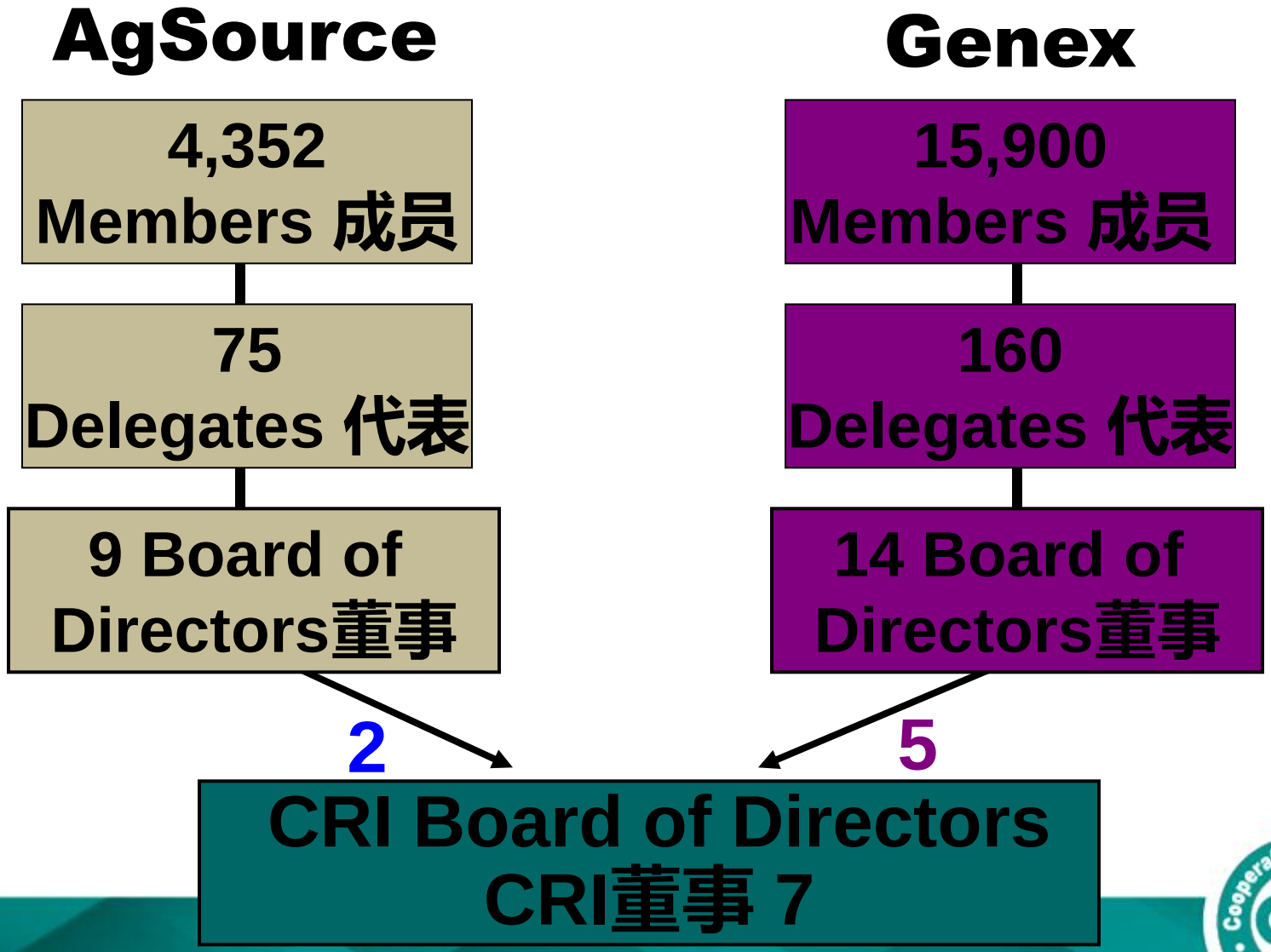
Genex
Farm Systems
A Division of Genex Cooperative, Inc.

International 国际



- **6 million units of semen exported 出口600万剂冻精**
- **80 countries 销往80个国家**
- **Many distributors are leading providers of multiple products and services in their country**
  多数经销商在本国都处于前列
- **CRI has extensive relationships in all leading livestock producing countries**
  CRI和所有畜牧发达国家均有深入合作

Governance Structure 组织结构



Precision Farming精确农业

- Precision Farming精确农业
  - A farming management concept based on observing, measuring and responding to inter and intra-field variability in crops
    一种新的农场管理理念，通过网络对牧场农田观察，测量并做出反应
  - Enabled by GPS (Global Positioning System) and GNSS (Global Navigation Satellite System)
    通过GPS（全球定位系统）和GNSS（全球导航卫星系统）实现。

Precision farming精确农业

- Crop Yield Monitors农田监控
  - Mounted on GPS equipped combines
    在联合收割机上加装GPS
- Variable Rate Technology 多种新技术
  - Seeders, sprayers 播种机，喷灌机
- Vehicle Mounted Sensors 车载感应器
  - Measures everything, even the chlorophyll in the growing plants
    可测量所有指标，甚至能检测植物中的叶绿素含量

Research研究

- Focus is on Decision Support Systems for whole farm management
  焦点在于整个牧场的决策支持系统

- Goal of *optimizing returns on inputs while preserving resources*
  目标是在保护资源的同时使投资的产出最大化

Precision Technology has come to the Semen Business
精准科技也能应用于育种

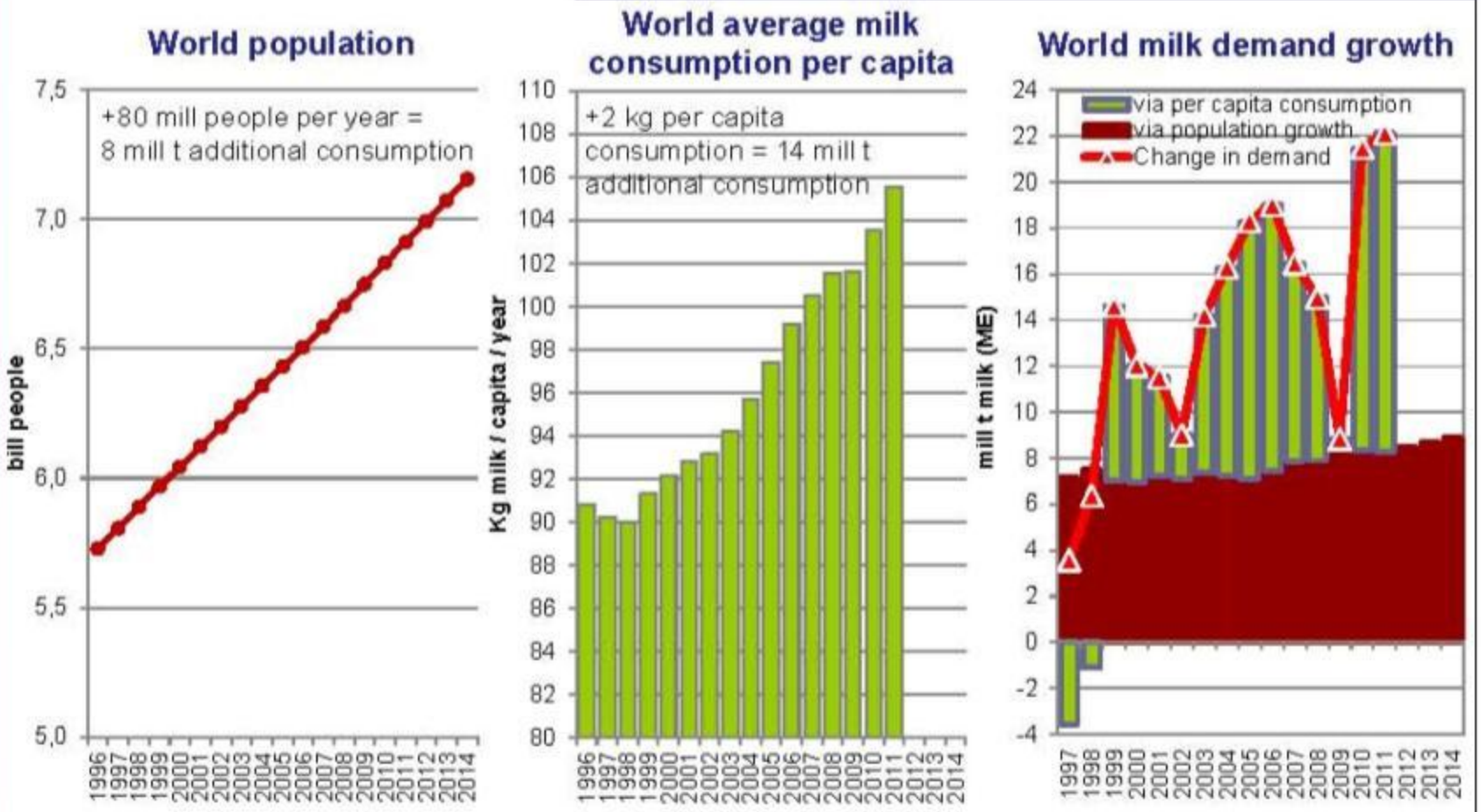
- Technology based on observing, measuring and responding to variability in cattle
  通过科技对奶牛做观察，测量和应答。

- Goal of *optimizing returns on inputs while preserving resources*
  目标是在保护资源的同时使投资的产出最大化

人口和牛奶消费的趋势

Population and milk consumption trends

A simplified view

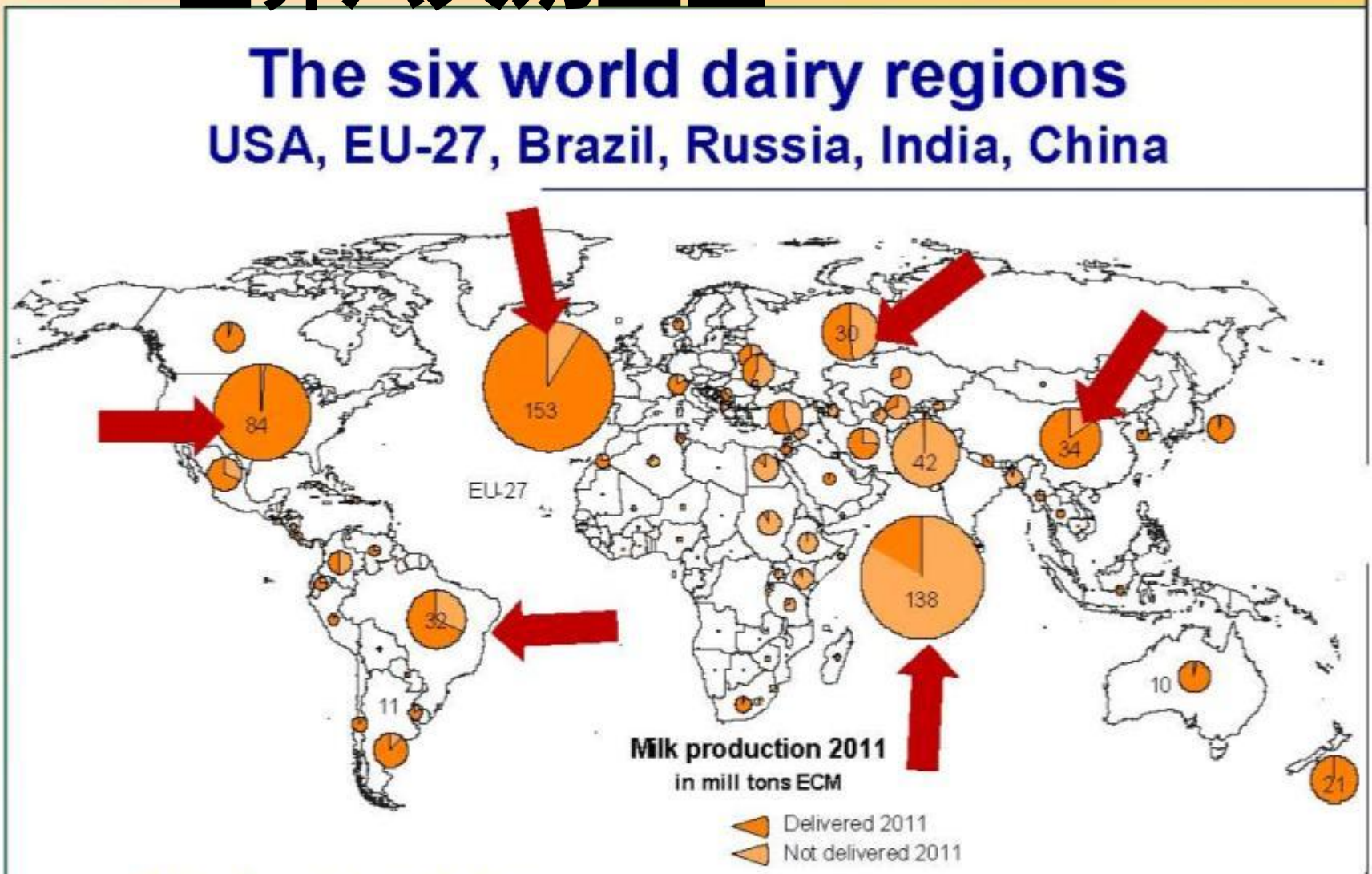


IFCN

Country per capita milk consumption = country milk consumption /population. ME: milk equivalent (4% fat, 3.3% protein). ECM: energy corrected milk (4% fat, 3.3% protein). Country milk consumption = country milk production (cows and buffalos, in ECM) + dairy imports (in ME) – dairy exports (in ME) +/- dairy stock changes (in ME; if available).

Source: IMF, IFCN Dairy Research Center

世界六大奶业区

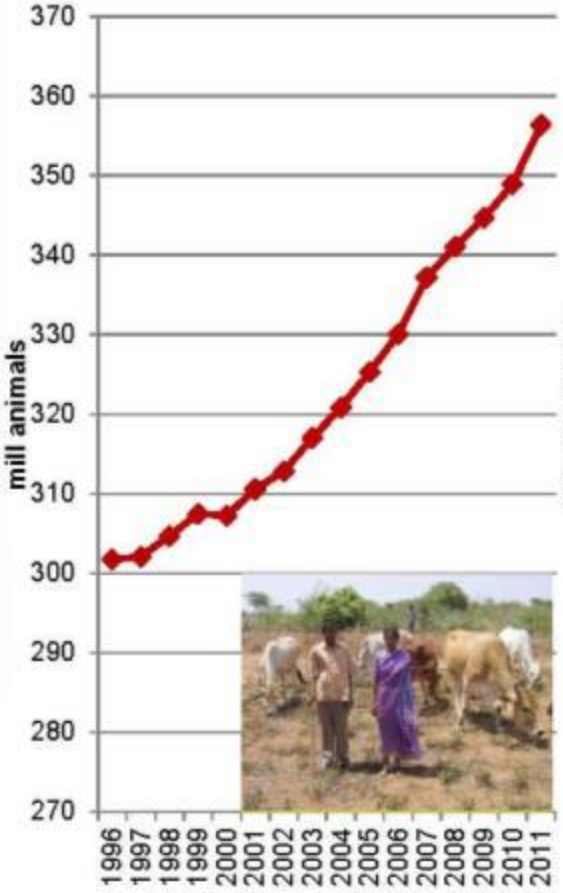


奶牛存栏和牛奶产量

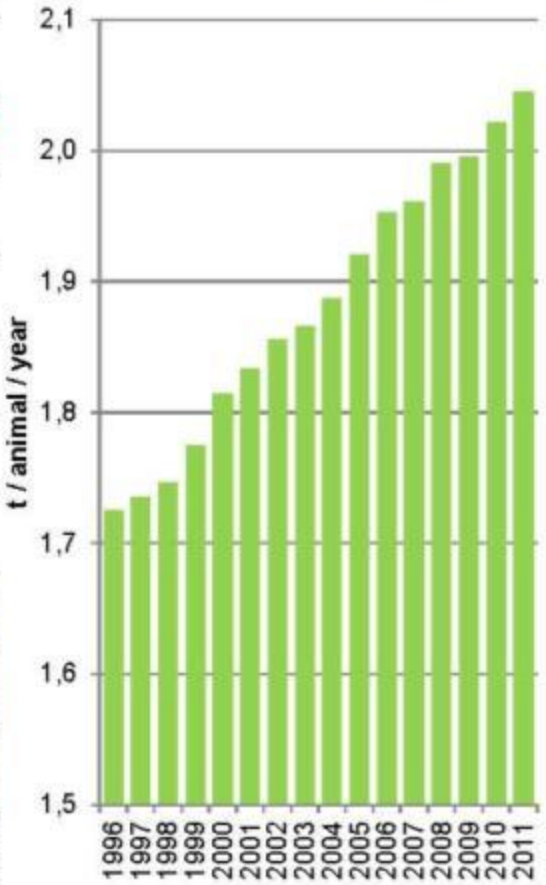
Milk production drivers

Cow and buffalo numbers vs. milk yield

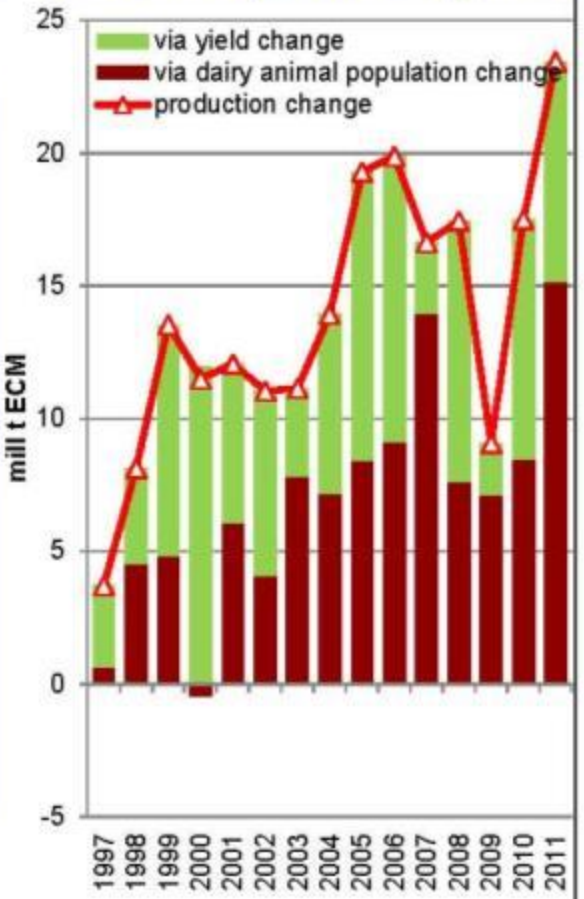
World cow and buffalo population



World average milk yield



World milk production growth



IFCN

Source: IFCN Dairy Research Center

2011年排名前10的产奶国家

Top dairy countries in 2011
figures in ECM and natural contents

Cow and buffalo milk production - with EU-27 as single countries

No.	Country	Milk production in mill t ECM	Milk production in mill t natural content	Milk delivered in mill t ECM	Milk delivered in mill t natural content
1	India	137.5	121.2	23.0	20.5
2	USA	84.3	89.0	83.8	88.5
3	Pakistan	41.6	35.6	1.3	1.1
4	China	33.9	37.4	29.2	32.8
5	Brazil	32.0	33.0	21.8	22.5
6	Germany	31.1	30.3	30.1	29.3
7	Russia	30.1	31.7	15.5	16.4
8	France	25.2	25.3	24.6	24.7
9	New Zealand	21.3	18.9	21.3	18.9
10	United Kingdom	14.1	14.1	13.8	13.8
11	The Netherlands	12.7	12.0	12.4	11.6
12	Turkey	12.2	12.8	6.7	7.1
13	Poland	12.0	12.1	8.9	9.0
14	Argentina	11.4	12.0	10.2	10.7
15	Italy	11.3	11.6	10.5	10.8
16	Mexico	11.1	11.1	7.7	7.7
17	Ukraine	10.2	11.1	4.3	4.6
18	Australia	9.8	9.6	9.5	9.3
19	Iran	9.8	9.7	7.2	7.3
20	Canada	8.9	9.2	8.6	8.8
	World	**721.4**	**708.7**	**447.0**	**453.2**

Explanation: Energy corrected milk (ECM) adjusted to 4% fat and 3.3% protein

IFCN

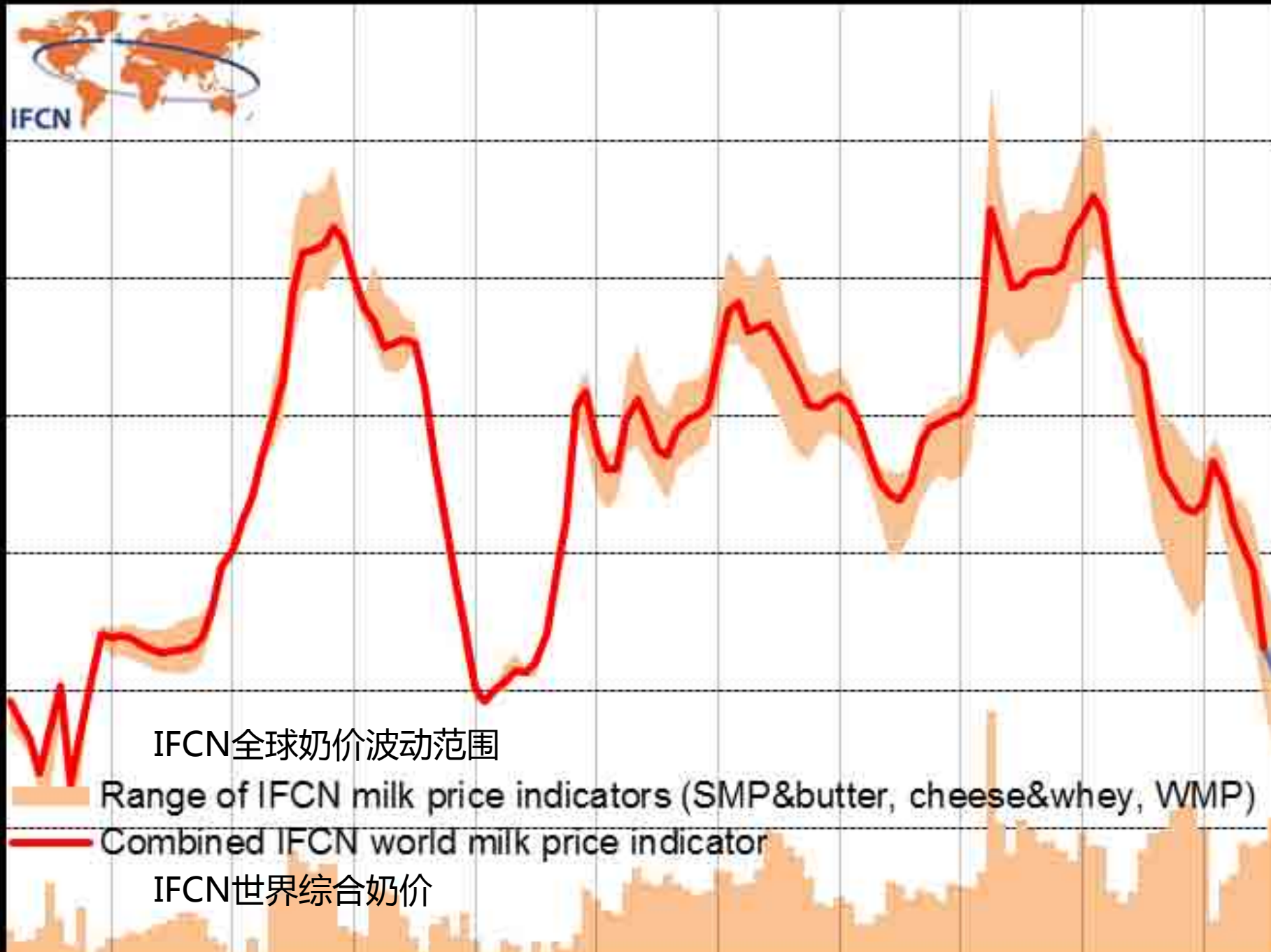
Source: IFCN Dairy Report 2012

Global Production (lbs)全球奶产量（磅）

Area地区	1985年单产 Production/ Cow 1985	2010年单产 Production/ Cow 2010	净增 Change
U.S.美国	12,500	20,100	+7,600
Europe欧洲	8,700	12,400	+3,700
China中国	4,900	8,700	+3,800
New Zealand新西兰	6,000	8,600	+2,600

Global Dairy Population
全球奶牛存栏

Area地区	Dairy Cows 奶牛	% of World 比重%	% Change Last Decade 过去10年变化
Africa非洲	60,407,495	23.9	+14.4
Americas美洲	52,278,422	20.7	+9.2
Asia亚洲	93,840,468	37.1	+27.3
Europe欧洲	39,820,843	15.8	-21.8
Oceania大洋洲	6,337,323	2.5	+14.0
Total合计	252,684,551	100.0	+14.4



What does this mean?From macro perspective:
对于全球，这意味着什么？

- **Must have:务必**
  - Higher production增加产奶量
  - Higher efficiency提高效率
  - Herd size growth扩群
- **Countries want to become less dependent**
  许多国家希望减少依赖性
    - Russia, China, Mexico俄罗斯，中国，墨西哥

What does this mean?On the Farm Level:
对于牧场：意味着什么？

- **Producers want more efficiency:**
  场主希望更有效率
  - Higher yield高产
  - Better reproduction更好的繁殖
  - Higher productive life延长生产寿命
  - Raise less heifers - which ones?
    减少饲养后备牛-淘汰哪一些？
  - Less feed per kg/lbs of milk/meat
    减少每公斤牛奶/牛肉所消耗的饲料

Trends趋势

- Genomics基因组
- Sexed Semen性控冻精
- Jersey – Holstein娟姗-荷斯坦

Genomics by Definition
基因组学定义

- The study of nucleotide sequences in the chromosomes of an organism and its application in genetic improvement programs.
- 研究生物染色体的核苷酸序列，以及其对遗传改良的作用。

Why study the genome?
为什么研究基因组？

- Find the highest bulls 找出最优秀的公牛。
- Be able to use these bulls at a younger age for faster genetic progress 在这些公牛年轻时使用其冻精，获得更快的遗传进展。
- Search for genes that cause disease寻找致病基因。

Genomics is Here to Stay!
基因组时代已经到来

- Widely accepted and utilized
  已经被广泛接受和使用
- Solid science with overall proof stability
  有全面稳定的证据证明其科学性
- Dramatic increased in the rate of genetic improvement
  显著提高遗传进展

Genomic Trend基因组趋势

% of Dairy Sales年份	USA Industry 美国	CRI – USA CRI在美国市场	CRI – Int'l CRI在全球市场
2010	20%	40%	5%
2011	30	65	10
2012	40	75	20
2013	50	80	30

Stability of genomic evaluations
基因组预测的稳定性

- 642 Holstein bulls　642头荷斯坦公牛
  - Dec. 2012 NM$ compared with Dec. 2014 NM$
    2012年12月NM$与2014年12月NM$数据做比较
  - First traditional evaluation in Aug. 2014
    在2014年八月份做第一次传统的评估
  - ≥50 daughters by Dec. 2014
    直至2014年12月拥有的女儿数超过50头

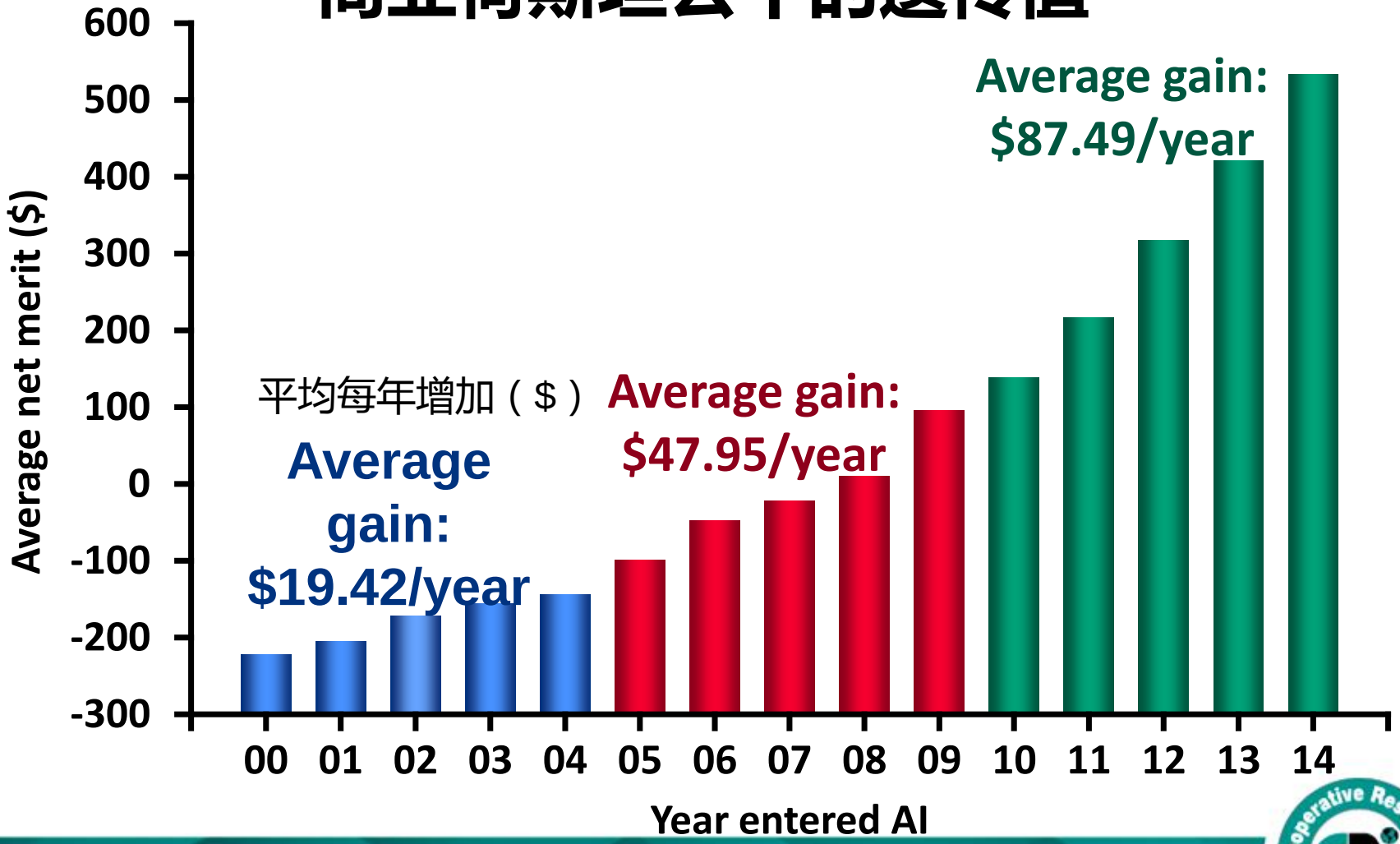
- Top 100 bulls in 2012在2012年排名前100的公牛
  - Average rank change of 9.6

    平均会有9.6个名次的变化
  - 119 Maximum drop 最大跌幅119名
  - Maximum rise of 56最大升幅56名

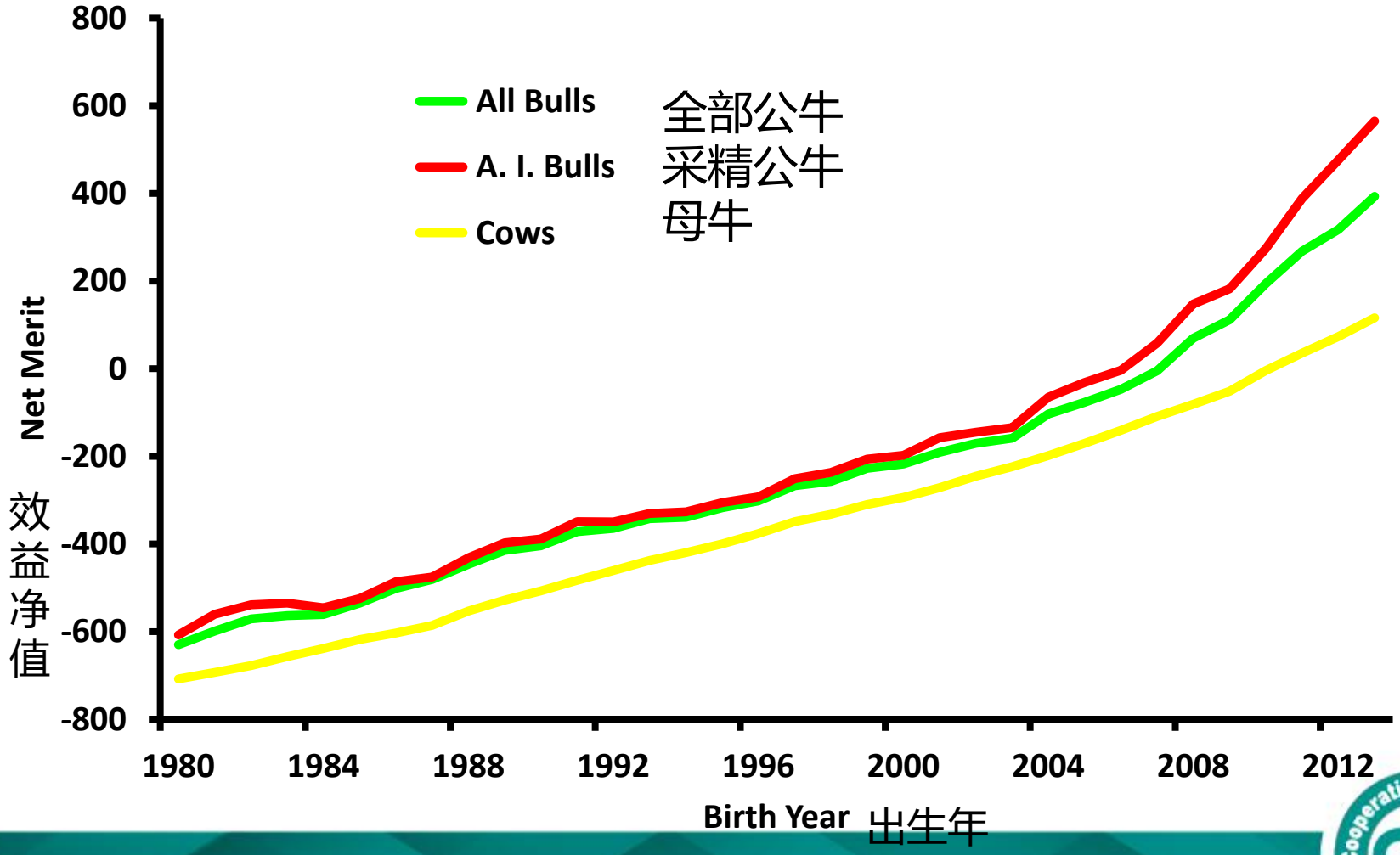
All 642 bulls全部642头公牛

- Correlation of 0.94 between 2012　2014
  两年的排名相关系数达到0.94
- Regression of 0.92
  回归系数达到0.92

Genetic merit of marketed Holstein bulls
商业荷斯坦公牛的遗传值



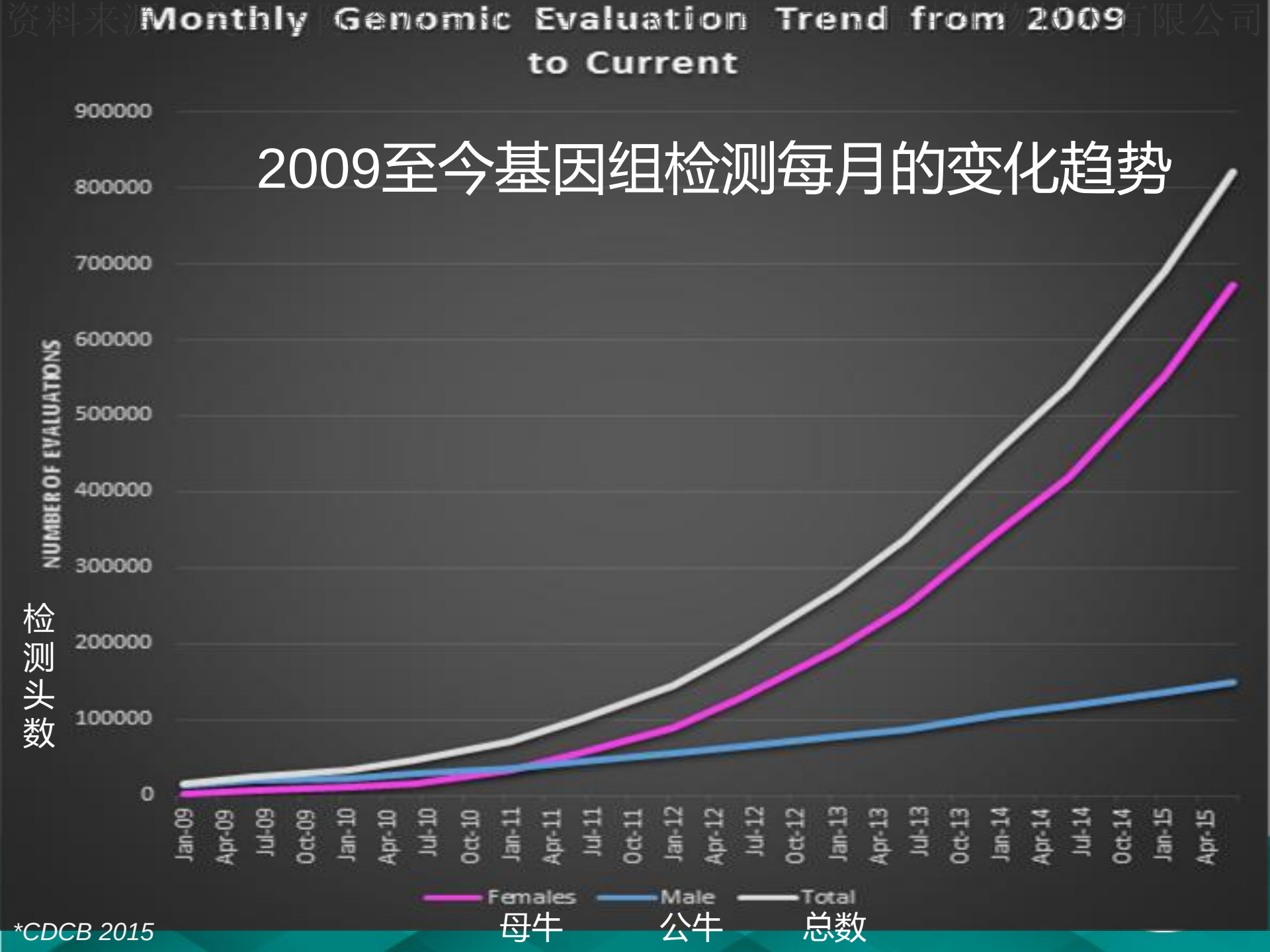
Trend in Net Merit $
终身效益指数的变化趋势



Marketed Holstein bulls
在售荷斯坦公牛

Year entered AI 生产冻精年份	Traditional progeny-Tested传统后测	Genomic marketed 基因组	All bulls 全部公牛
2008	1,768	170	1,938
2009	1,474	346	1,820
2010	1,388	393	1,781
2011	1,254	648	1,902
2012	1,239	706	1,945
2013	907	747	1,654
2014	661	792	1,453

2009至今基因组检测每月的变化趋势



检测头数

*CDCB 2015

母牛　　公牛　　总数

Genotype Counts by Breed and Sex
不同品种和性别的奶牛检测基因型的数量

Breed品种	Female母	Male公	All Animals总数	Female: Male雌/雄
Ayrshire约克夏	3,112	1,549	4,661	67:33
Brown Swiss瑞士褐牛	3,689	16,459	20,148	18:82
Guernsey更赛	1,829	610	2,439	75:25
Holstein荷斯坦	721,141	164,188	885,329	82:18
Jersey娟姗	97,717	18,832	116,549	84:16
Milking Shorthorn乳用短角	10	12	22	45:55
All总数	827,498	201,650	1,029,148	80:20
2014 only2014年	248,309	43,861	292,170	85:15

***20,000 – 30,000 new Holstein Females Each month
荷斯坦奶牛每月新增2万-3万头母牛进行基因型测定

GENESIS Nucleus Program
杰尼斯核心群项目

- Longest running nucleus program in North America; in operation for over 20 years

北美运营时间最长的核心群项目，超过20年。

- Greater genetic progress with accurately evaluated females and reduced generation interval

通过精确评估及缩短世代间隔，获得了巨大的遗传进展。

Co-Op Boliver YOYO-ET #1 NM and GTPI Cow

GenChoice sexed semen

性控冻精

… heifer calves create opportunities.

更多母犊，更多机会

Sexed Semen Trend性控冻精销售态势

(CRI International Sales)（基于CRI国际部销售数据）

Year年份	% GenChoice of Dairy Sales销量
2009	7.0%
2010	8.8
2011	11.7
2012	12.7
2013	15.7
2020	20%

New Technologies Provide Opportunities
新技术带来更多的机会

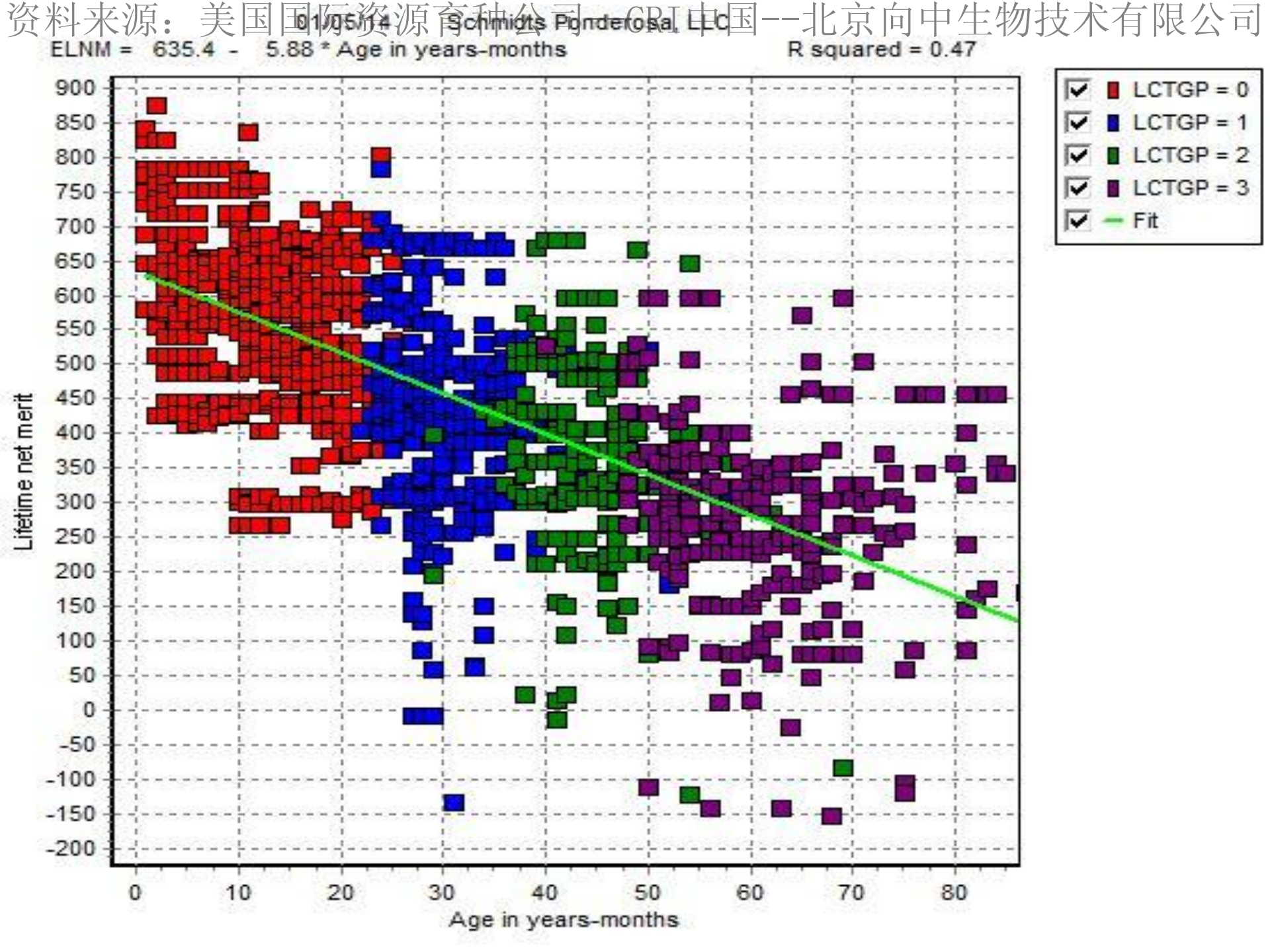
- Gender-sorted Semen 性别分离精液
  - Calving advantage reducing difficult births
    产犊优势降低了难产的发生
  - Maximize profitability and overall animal welfare through voluntary culling.
    通过主动淘汰最大化牧场效益和动物福利

New Technologies Provide Opportunities
新技术带来更多的机会

- Gender-sorted Semen 性别分离精液
  - Meet herd growth goals through internal control.
    通过内部控制满足牛群增长目标
  - Invest and raise heifers from only your best cows.
    利用你最好的母牛生产犊牛
  - Sell excess heifers for new profit stream.
    销售过剩的犊牛以创造更多的利益

Impact of Genomics and GenChoice™
基因组技术和性控技术的影响

- Genetic technologies are about **better** cows, not necessarily more
  基因技术是为生产更好的牛，而不是更多的牛
- **Quality**, not always quantity 质量而不是数量



Jersey: the Breed of the Future?
娟姗牛：未来的品种？

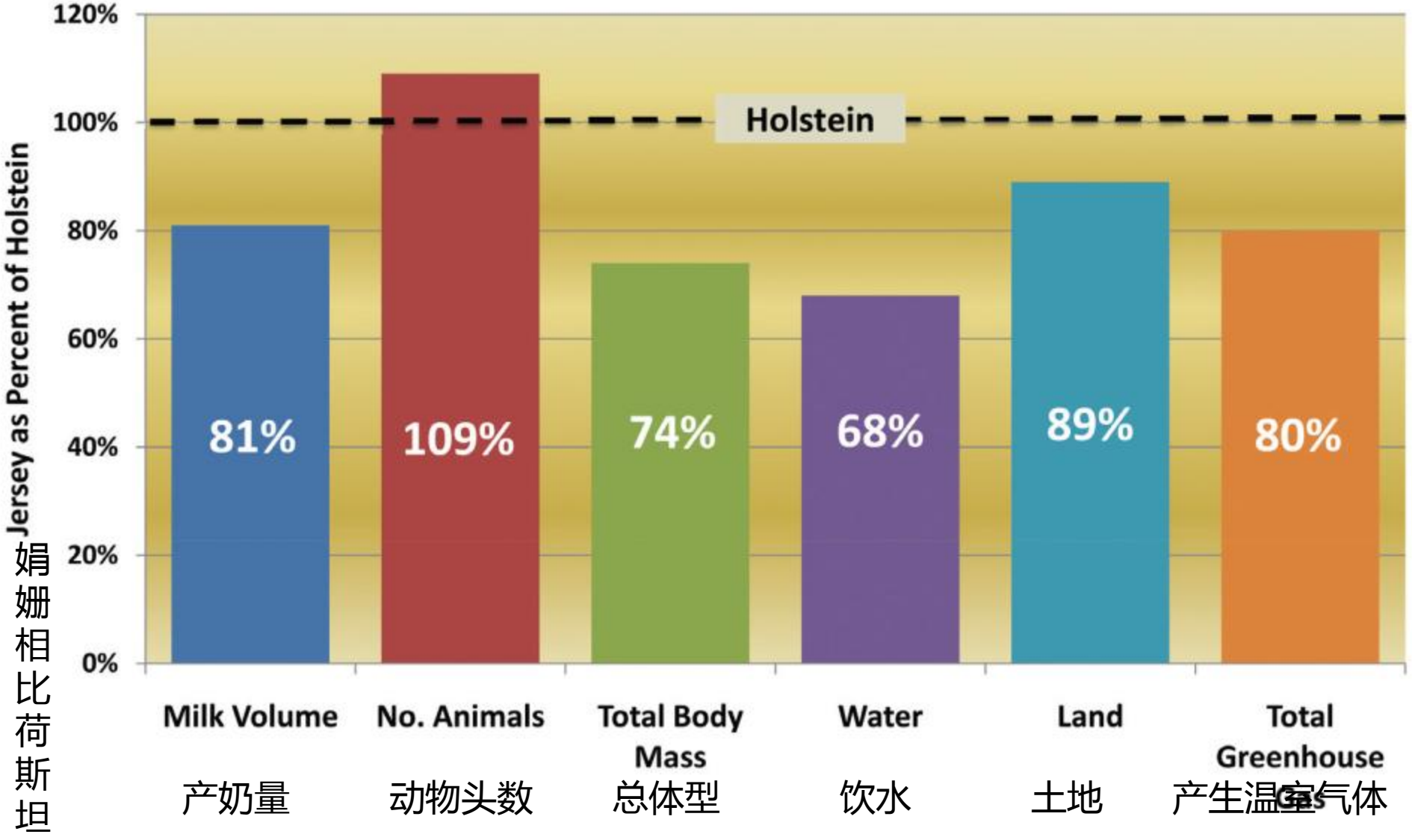
Year 年度	Jersey % sales in USA 美国娟姗牛冻精销量比重
2003	6%
2006	7%
2009	8%
2012	12%
2019	20%
2025	33%

Last four years Holstein semen growth rate in the USA was 3%, Jersey average growth rate 15%
过去4年中，美国荷斯坦冻精使用增长率为3%，而娟姗牛冻精使用增长率为15%。

Why Jersey?为何选择娟姗

Resources used per unit of cheese produced

每生产一单位乳酪所需要资源



Summary总结

- CRI is a World Class Genetics Company
  CRI是世界级的育种公司
- Increases in Global Milk Production requires Technology and Efficiency to Make Profits
  科技和效率帮助激增的全球奶业创造利润
- The combination of technologies increases the effectiveness of breeding programs
  使用新科技，育种规划更有效率

謝謝

THANK YOU！