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Dairy farm economy: differences in performance and possibilities to optimize
奶牛牧场经济：指标差异性和优化的可能性

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Background and objectives 背景和目标

China's milk production is moving towards large scale dairy farms. How are these farms performing? How does performance relate with size of the farm or milk yield per cow or other factors. And is there room for improvement? 中国牛奶生产正在走向大规模牧场生产，这些牧场经营得如何？指标与牧场规模或者奶牛单产或其它因素的相关性如何？是否有提升的空间？

Activities 所做工作

- Database of large scale dairy farms made available by CAU: 132 farms
- 中国 农业大学提供的大规模奶牛牧场数据：132家牧场
- Data analysed by Wageningen UR.
- 瓦和宁根大学数据分析
- Analysis will be finished in 2018: **so now only preliminary results**!
- 2018将完成全部分析：现在只是初步结果

Results performance 结果指标

Choice of indicators: technical results (e.g. milk yield per cow), Profit results (e.g. margins), People results (e.g. milk quality, animal welfare (e.g lactation at culling) and planet results (e.g. manure treatment) 指标选择：技术指标（比如奶牛单产），利润指标（比如收益）、人类指标（比如牛奶质量，动物福利、宰杀年龄等）和地球指标（比如粪污处理等）

Group	< 500 total cattle	500-2000 total cattle	> 2000 total cattle
Nr of farms	34	69	28
Farm set up			
Total cattle	322	949	5637
Milking cows	205	555	3176
Own land for forage (mu)	414	1162	2899
Total staff	13	32	121
Results technical			
Total milk production (tons/day)	4.0	12.0	84.3
Total milk production (ton/year)	1445	4373	30757
Milkyield per cow (ton/year).	7.6	8.7	9.5
Fat (%)	3.93	3.89	3.72
Protein (%)	3.20	3.23	3.24

Table 1. Farm set up and technical results e for three size classes of dairy farms. 表1. 牧场设置和三类牧场的技术指标

Group	< 500 total cattle	500-2000 total cattle	> 2000 total cattle
Nr of farms	34	69	28
Results profit			
Milk price (¥/kg milk)	3.44	3.60	3.77
Feed costs (¥/kg milk)	2.20	2.16	2.11
Total costs (¥/kg milk)	3.14	3.15	3.46
Margin milk over feed costs (¥/kg milk)	1.25	1.43	1.68
Margin milk&cattle sales over total costs (¥/per kg milk)	0.57	0.73	0.65
Milk production/staff member (kg/year)	140445	171080	258264

Table 2. Economic performance for three size classes of dairy farms. 表2. 三类奶牛牧场的经济指标

- Bigger farms tend to have higher milk yield per cow, tend to have higher milk price and higher total costs较大牧场倾向于实现了较高的奶牛单产、较高的牛奶价格和较高的成本

Group	< 500 total cattle	500-2000	> 2000 total cattle
Results people (nr of farms)	34	69	28
BC, Bacterial count(10000/ml)	3.9	6.3	6.3
SCC(10000/ml)	23.2	22.6	19.5
Total disease incidence (% per month)	11	13	10
Lactation at culling	3.18	3.35	2.73

Table 3. Milk quality and animal welfare results for three size classes . 表3. 三类牧场的牛奶质量和动物福利结果

Group	< 500 total cattle	500-2000	> 2000 total cattle
Results planet (nr of farms)	34	69	28
Manure treatment (%)	70	74	85
bio gas (%)	6	17	25
Feed efficiency (kg milk per kg dry matter intake)	0.99	1.10	1.16

Table 4. Share of farms with manure treatment, biogas and average feed efficiency (kg milk/kg dry matter intake for three size classes. 表4. 三类牧场粪污处理比例、沼气生产和平均饲喂效率

- Lactation at culling tends to be lower at largest scale farms 在大规模牧场中宰杀年龄较低。
- Larges scale farms have highest share manure treatment and biogas大规模牧场粪污处理比例最高，生产沼气比例也最高。
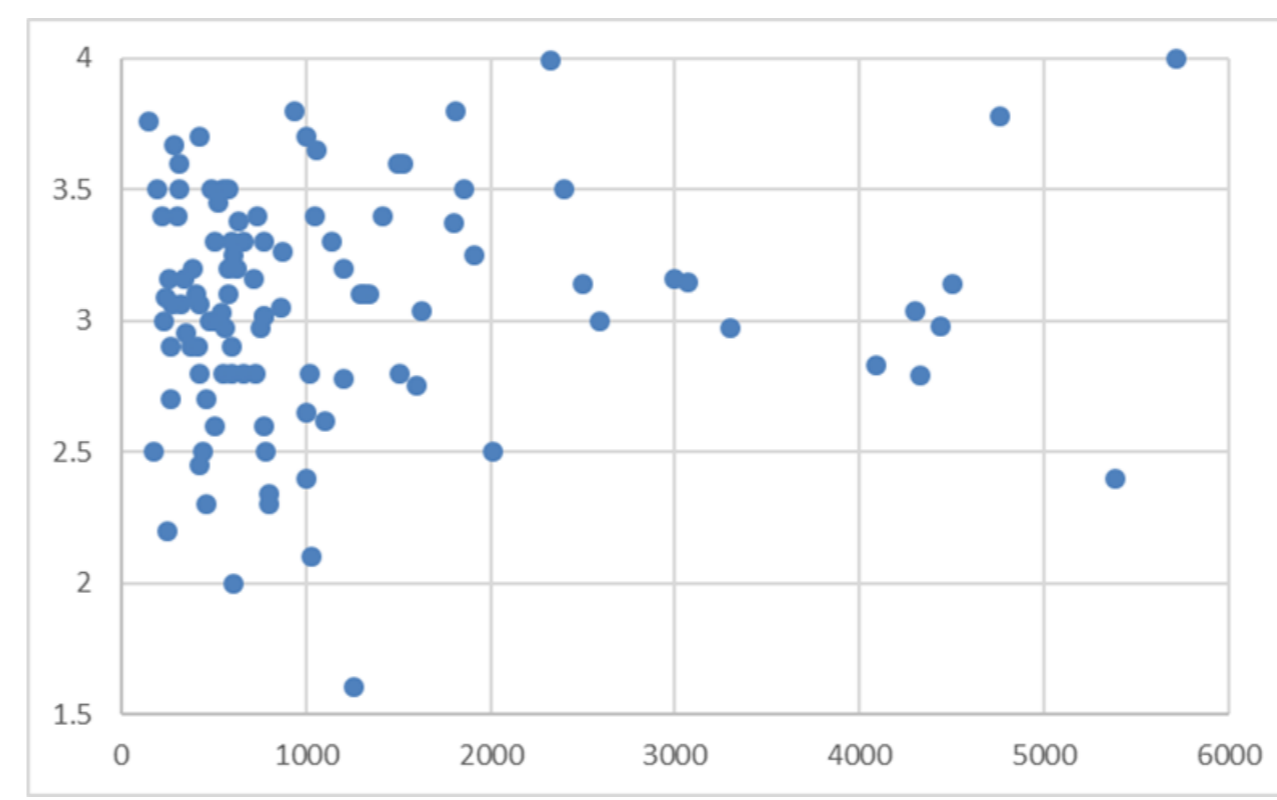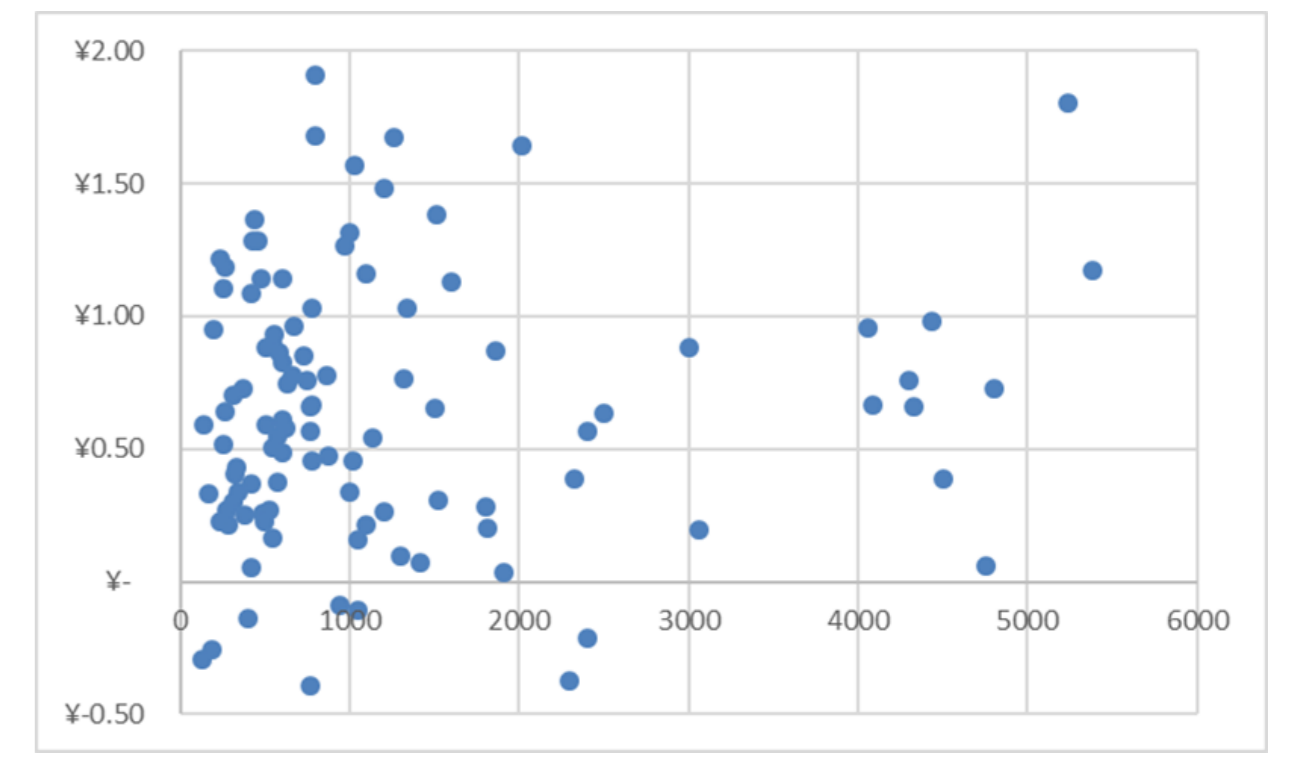
Results performance

**Figure 1.** Total costs per kg milk related to size of farm (total cattle) 图1. 规模牧场与单位牛奶总成本散点图

Figure 2. Margin milk&cattle sales per kg milk over total costs relate to farm size (total cattle) 图2 牧场规模与每单位牛奶利润（牛奶和小牛以及淘汰牛收入与全部成本之差）散点图

Database gives opportunity to benchmark individual farm
数据使我们有机会获取个体农场的基准参照

Benchmarking and improving基准参照和提升

- Assess strong and weak points评估其优势和弱点
- Set targets设置指标
- Start PDCA (Plan, Do, Check, Act/Adjust) 开始PDCA循环
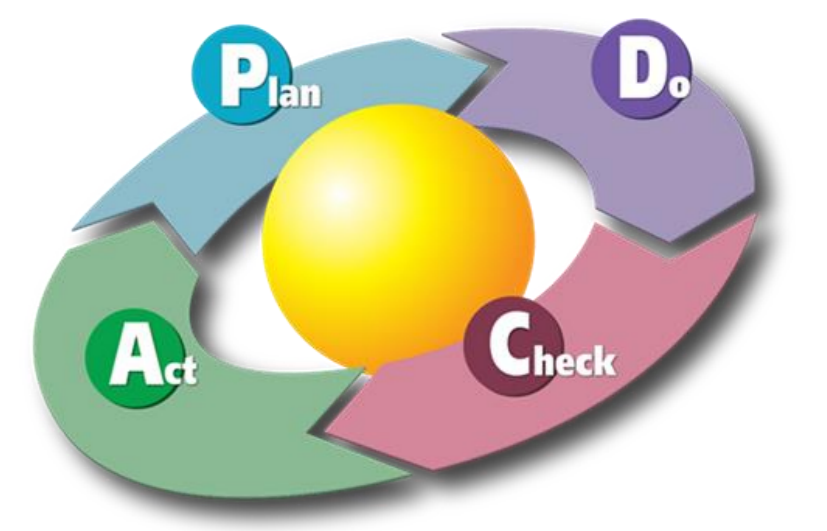
Conclusions结论

Within this group 组内

- No clear relation between farm size and economic performance牧场规模和经济指标没有明显的相关性
- Large differences within size classes gives possibilities to improve 组间差异提供了进一步提升的可能性

Structured and continuous data collection gives opportunity to 结构完整和持续性的数据收集提供了以下可能：

- Identify best performing farms and best practices 识别最优指标牧场和最佳实践
- Identify trends in performance识别指标倾向
- Monitor integral performance 监控整体指标
- And for individual farms possibility to benchmark and start pdca对个体牧场提供了基准参考和开始pdca循环的可能性

Preliminary results, further analysis will be executed and finished early 2018 以上是初步结果，进一步的分析将继续进行并在2018年初结束

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