Optimization in Feed Processing

Paul Alderliefste – BSc (Mechanical Engineering)

5th International Animal Nutrition Congress – Antalya 2025

The added value of feed processing

Animal health

Efficiency

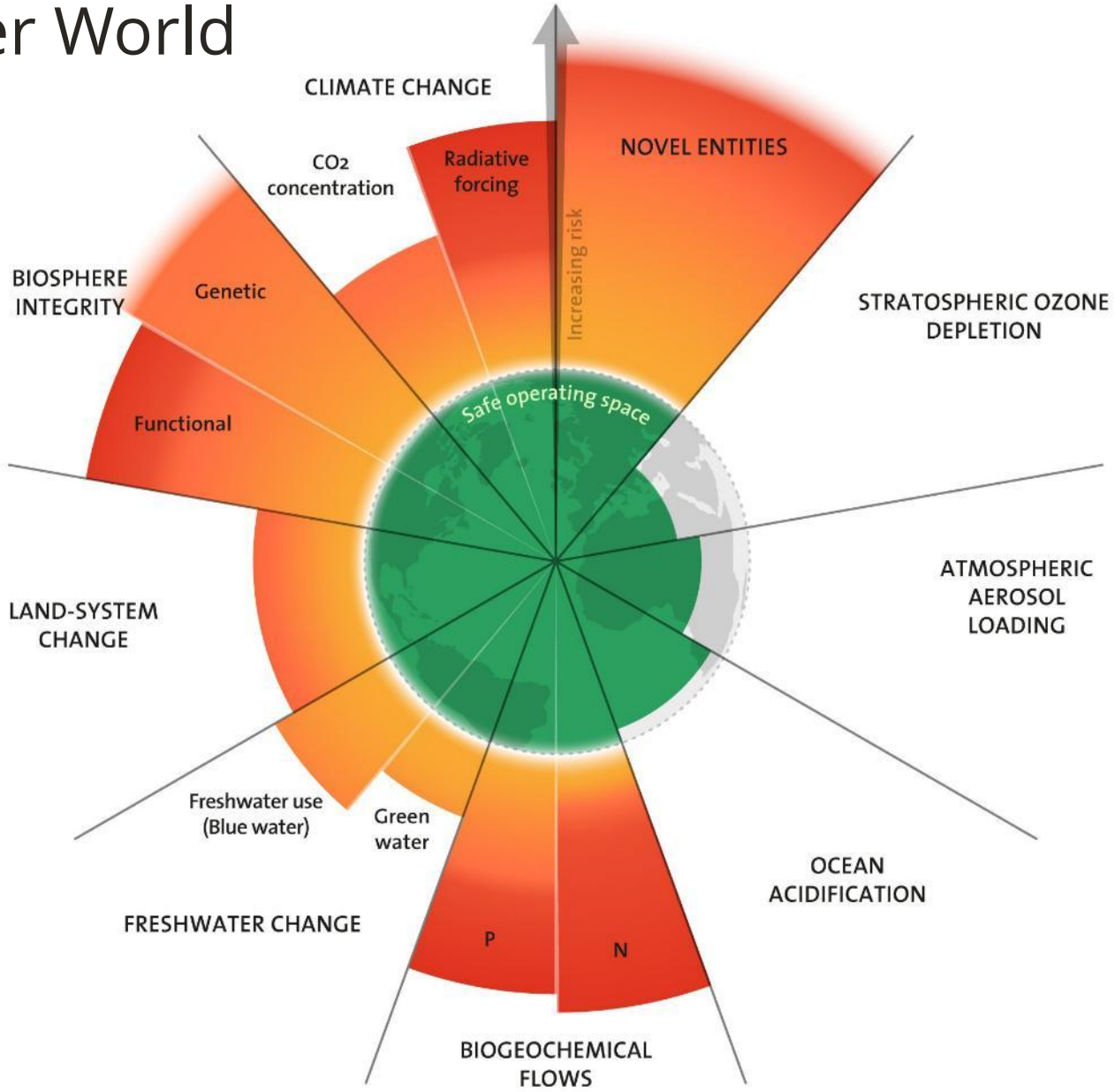
Productivity

Sustainability

Feeding, fueling & Building a Better World

Sustainability can be redefined as Prosperity and acuity with a stable resilient life supporting earth system.

Nine planetary boundaries define the safe operating space for humanity (Johan Rockström – 2009)



The Feed Processing Challenges

Variability in raw materials

Energy costs

Nutrient losses during processing

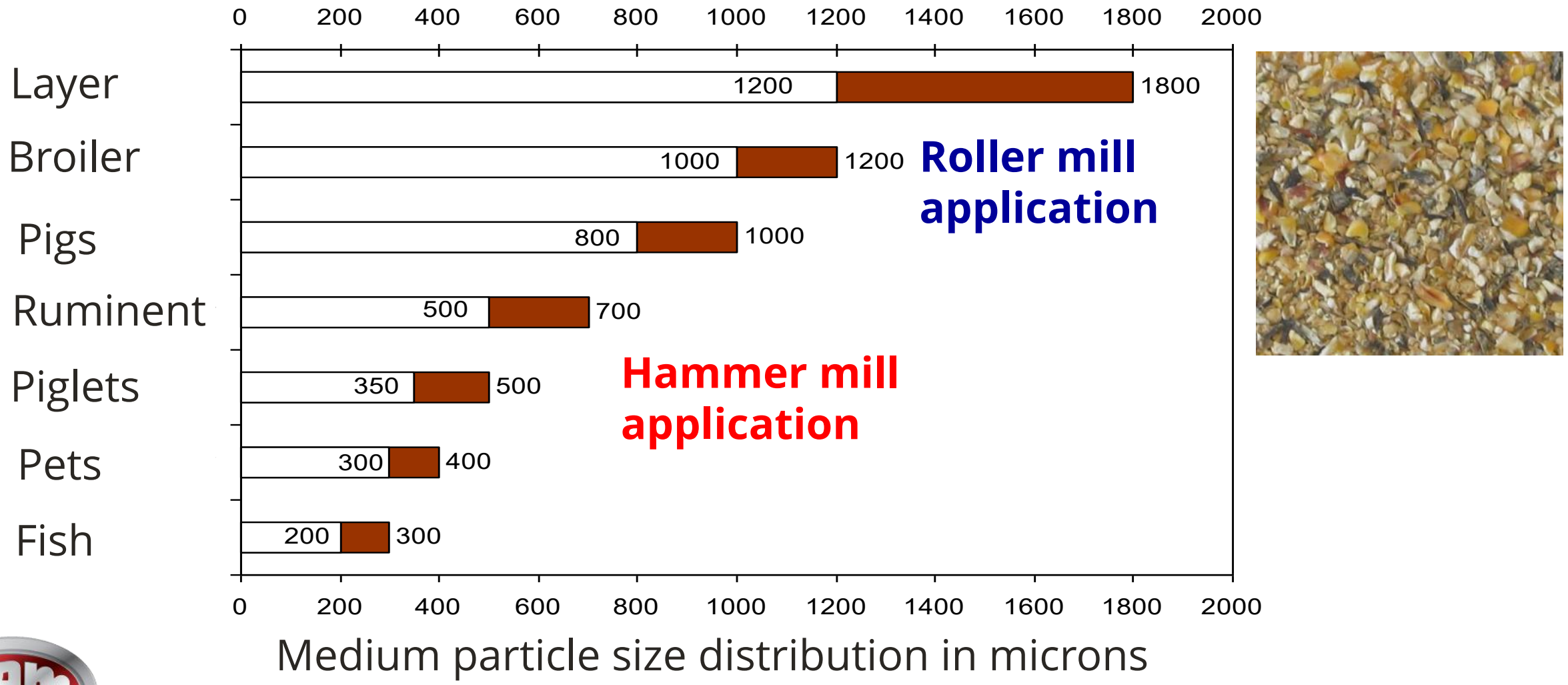
Grinding Innovations

Particle size optimization → digestibility & pellet durability

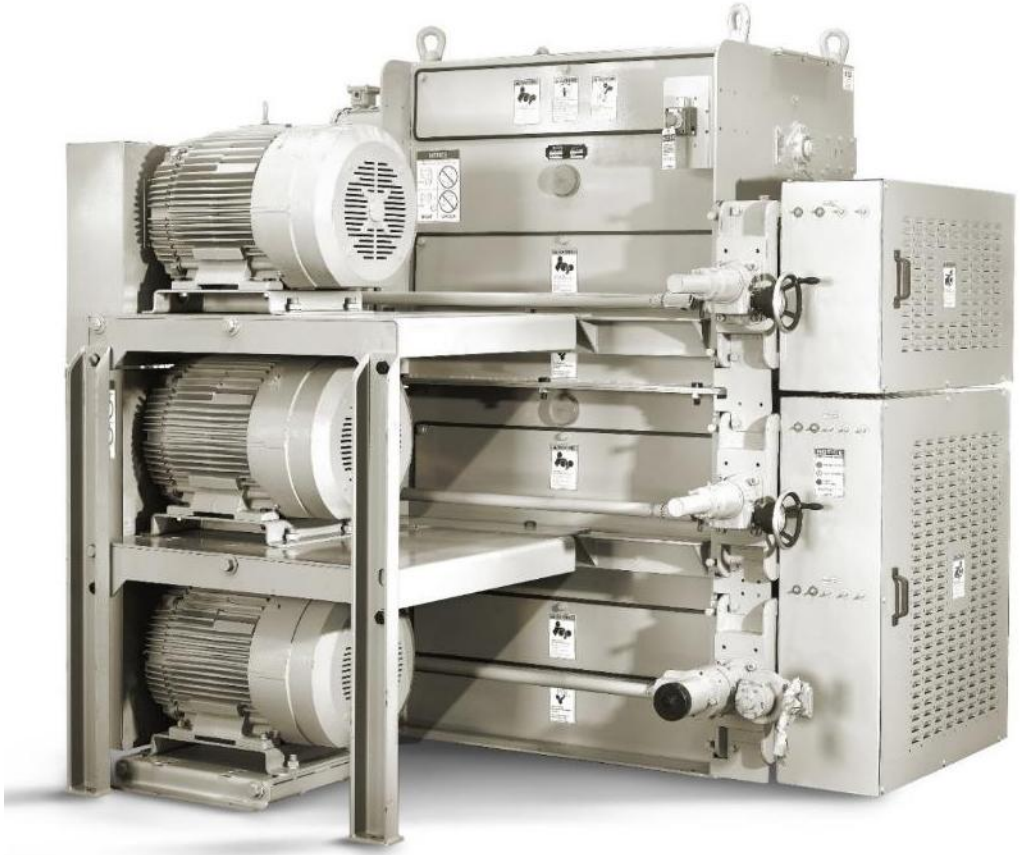
New technologies: hammer mill vs. roller mill efficiency

Energy-saving strategies

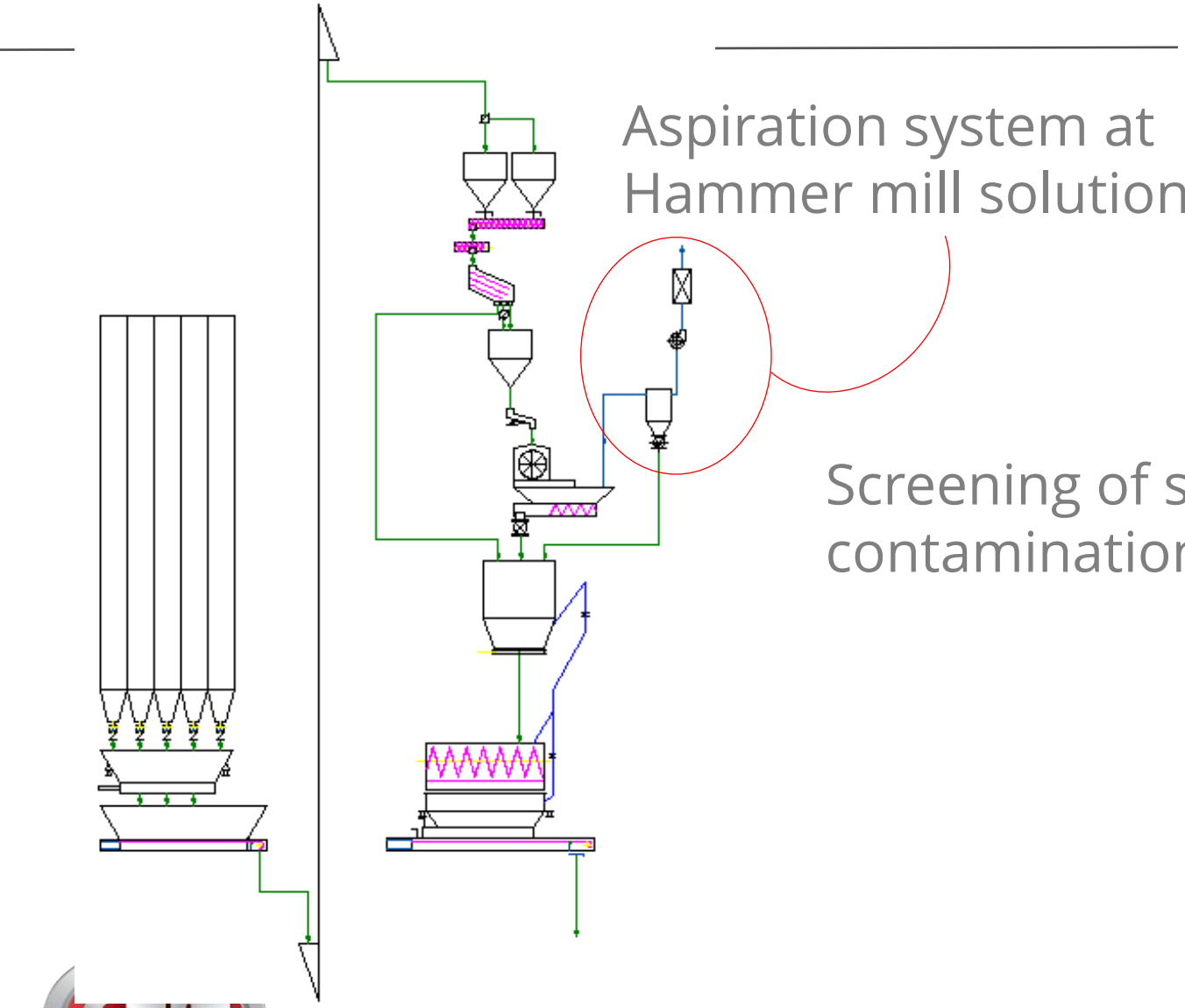
Particle size optimization → digestibility & pellet durability



The difference between a hammer mill and a Roller mill

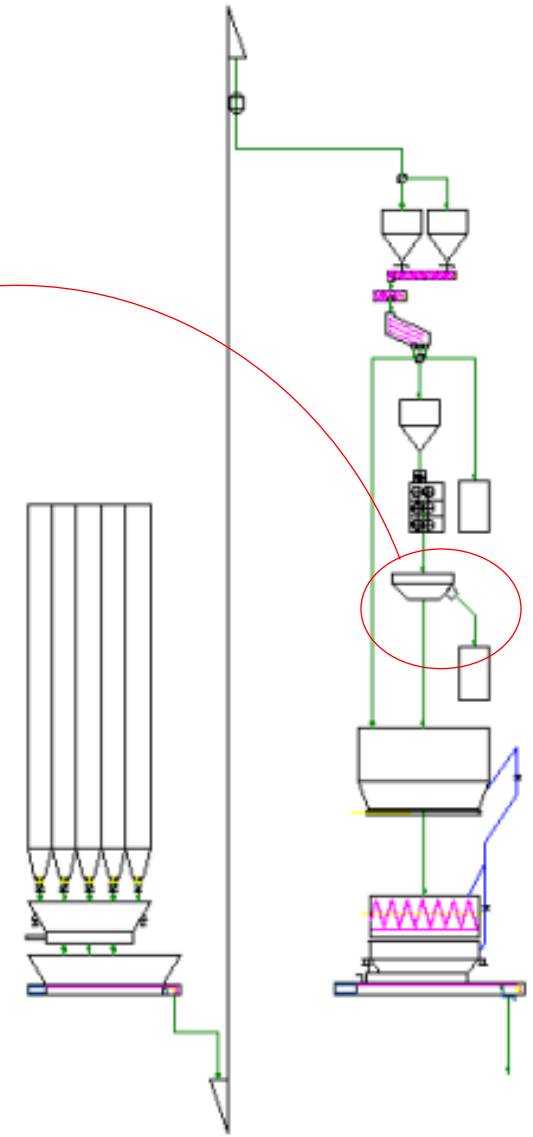


New technologies: hammer mill vs. roller mill efficiency



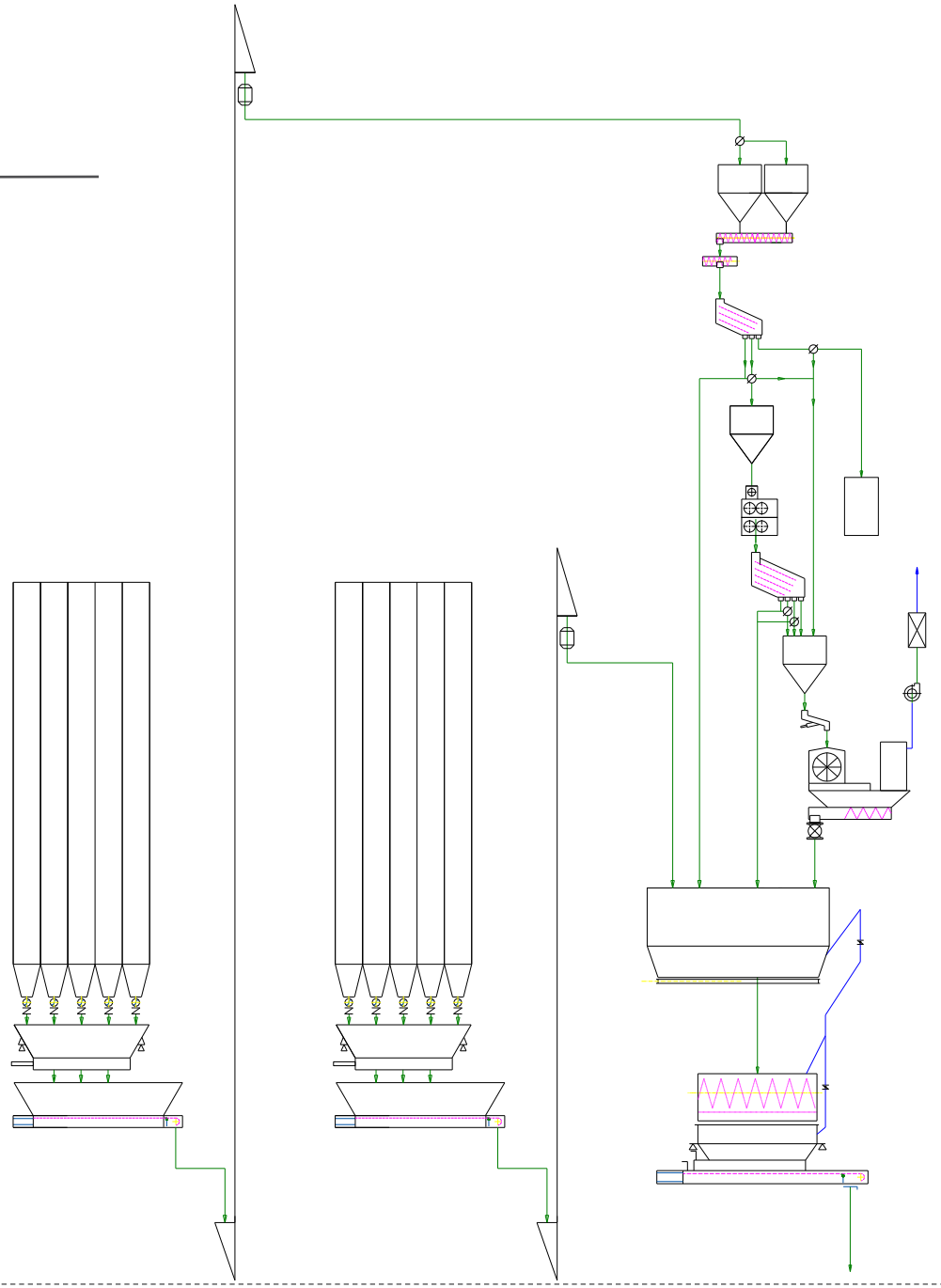
Aspiration system at
Hammer mill solution

Screening of straw
contamination



Energy-saving strategies

Combined Screening, Hammer mill and roller mill Grinding technology

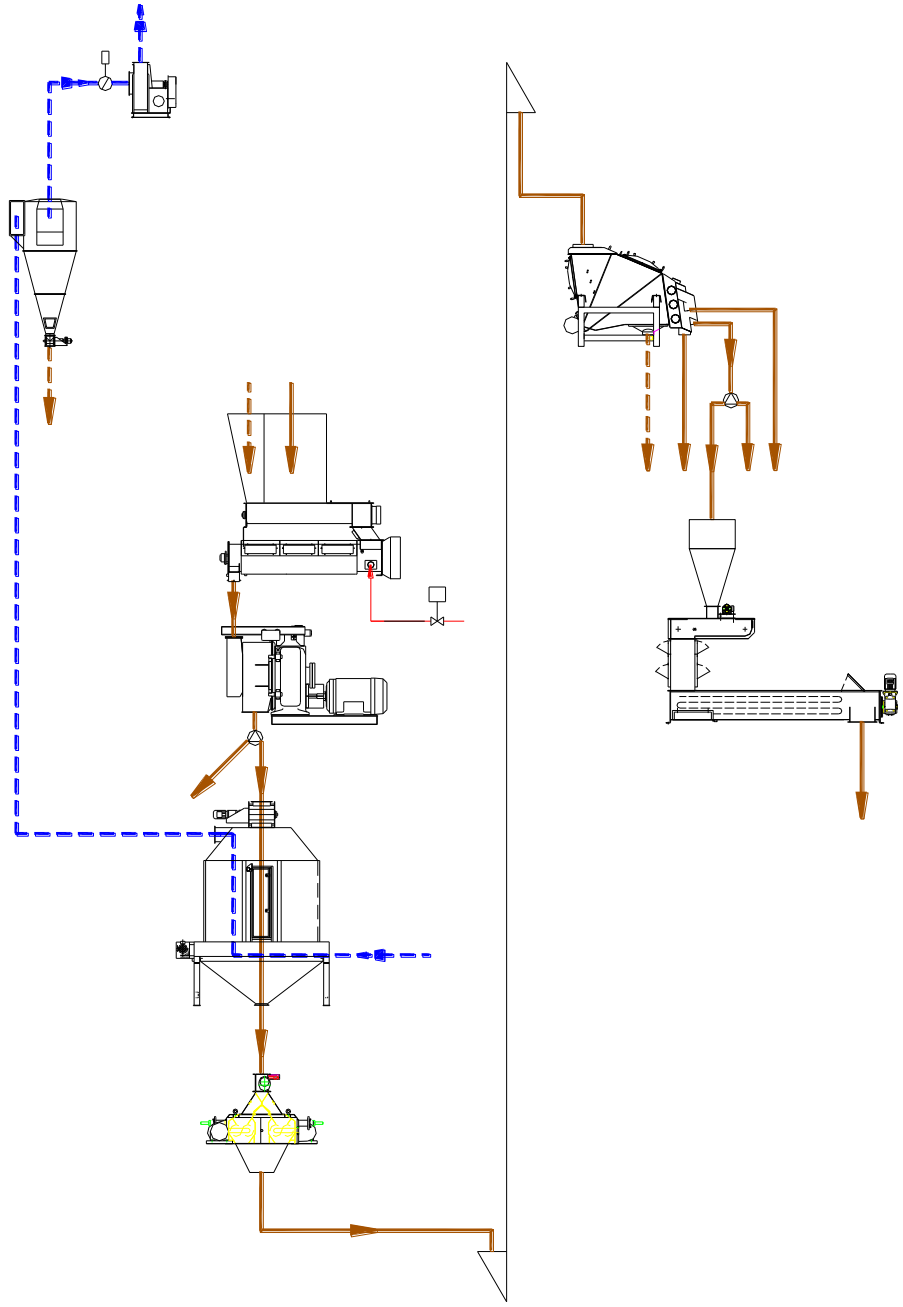


Conditioning and Pelleting

Role of moisture, temperature, and time.

Innovations: steam conditioning, precision moisture control.

Benefits: improved pellet quality, reduced fines



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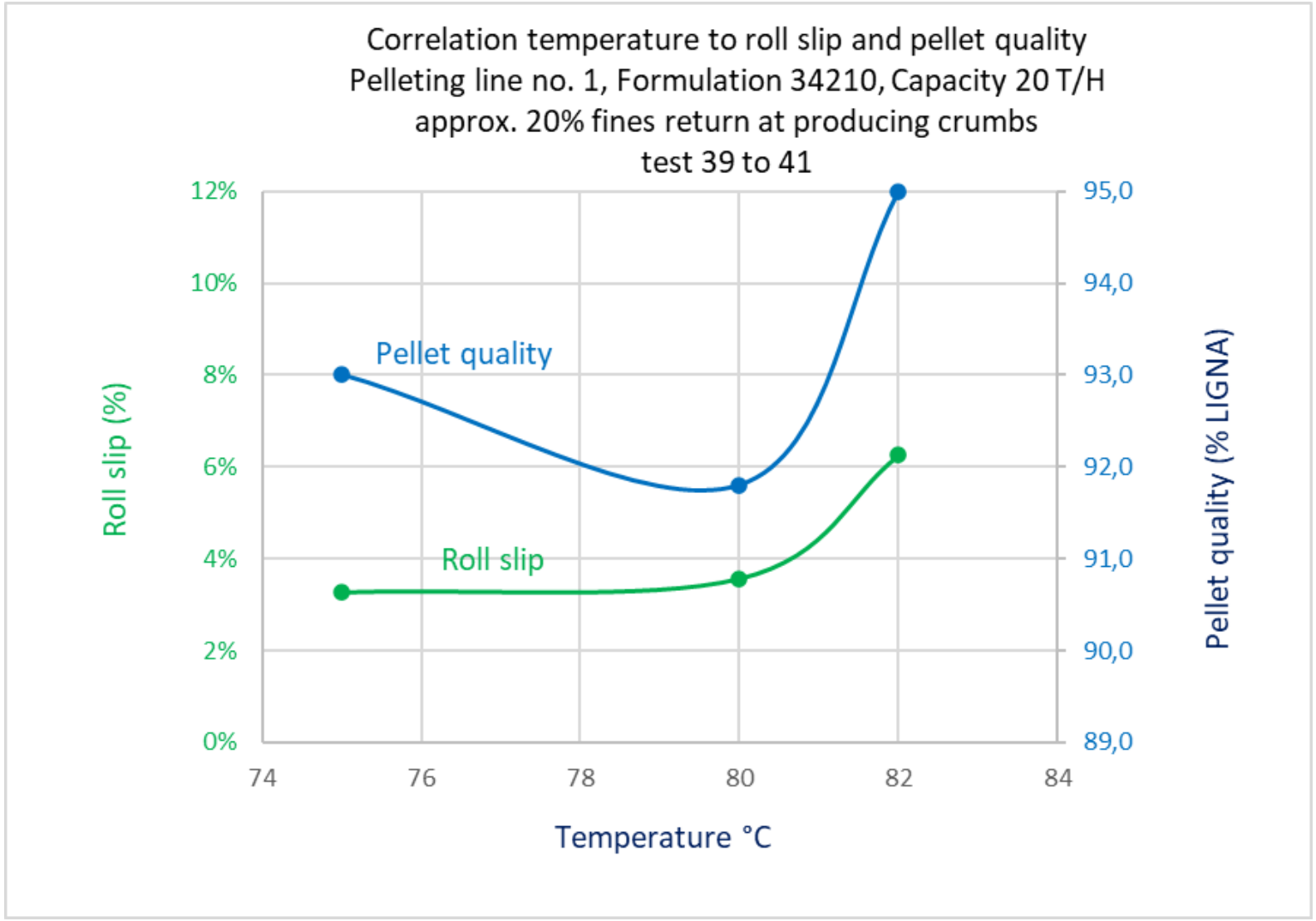
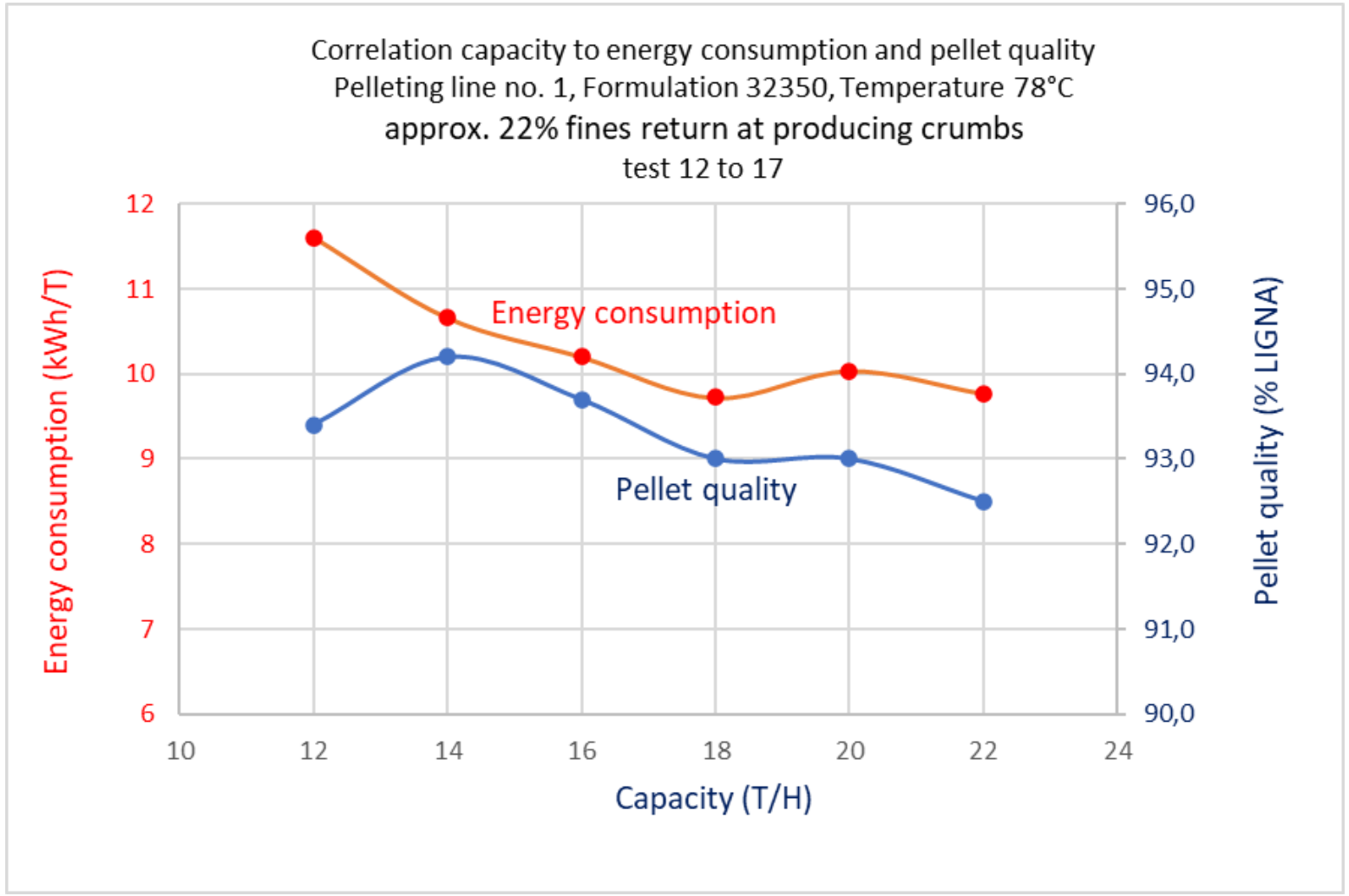
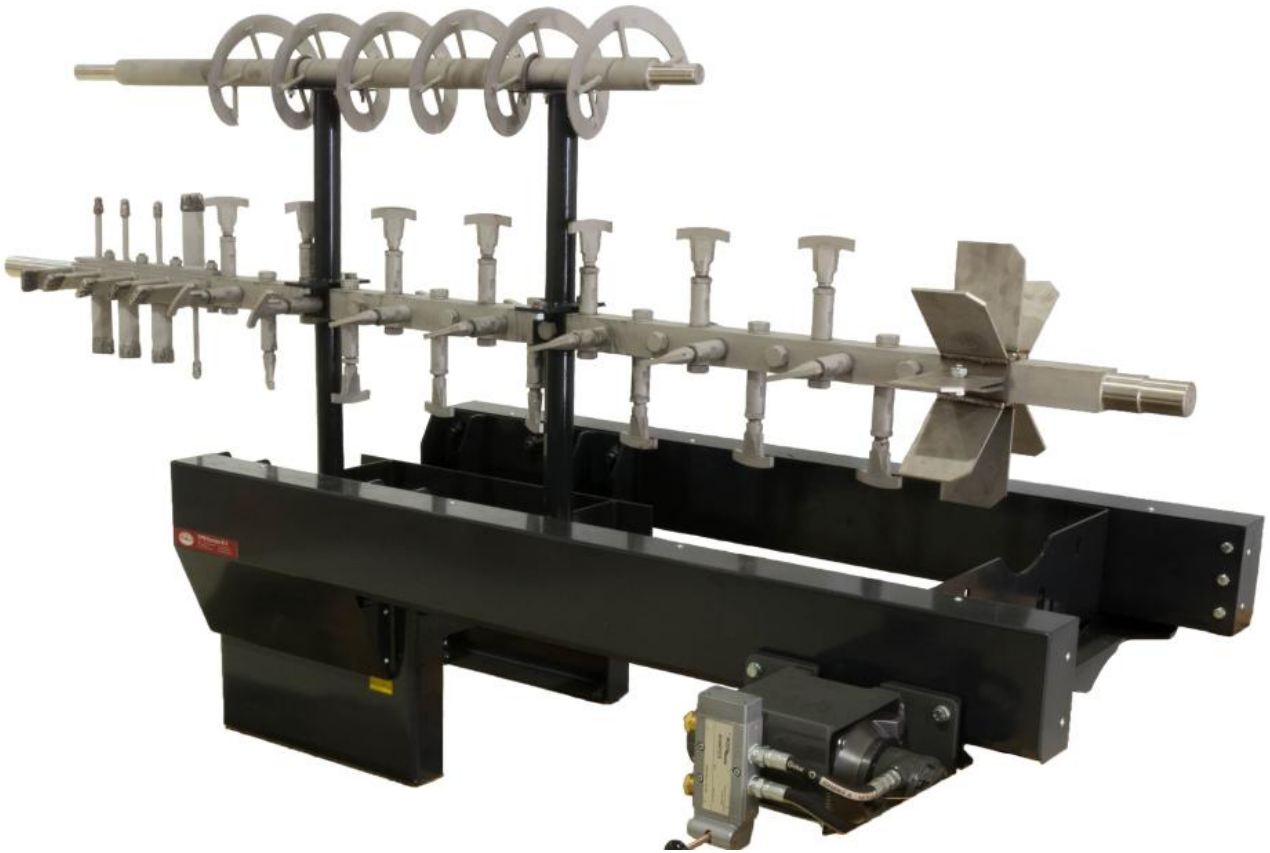


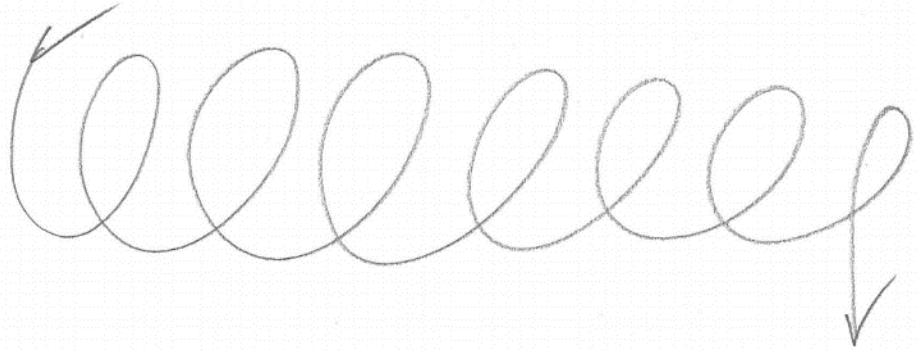
Role of specific energy input on pellet quality



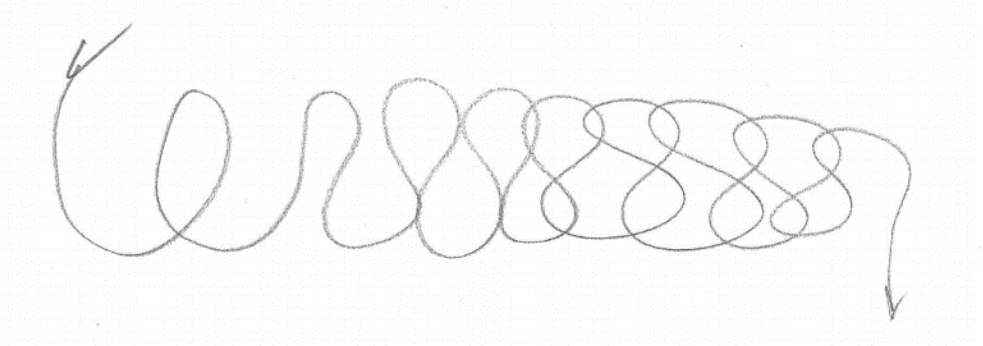
Steam conditioning, precision moisture control



Conventional product flow



New technology product flow



Heat Treatment of Feed

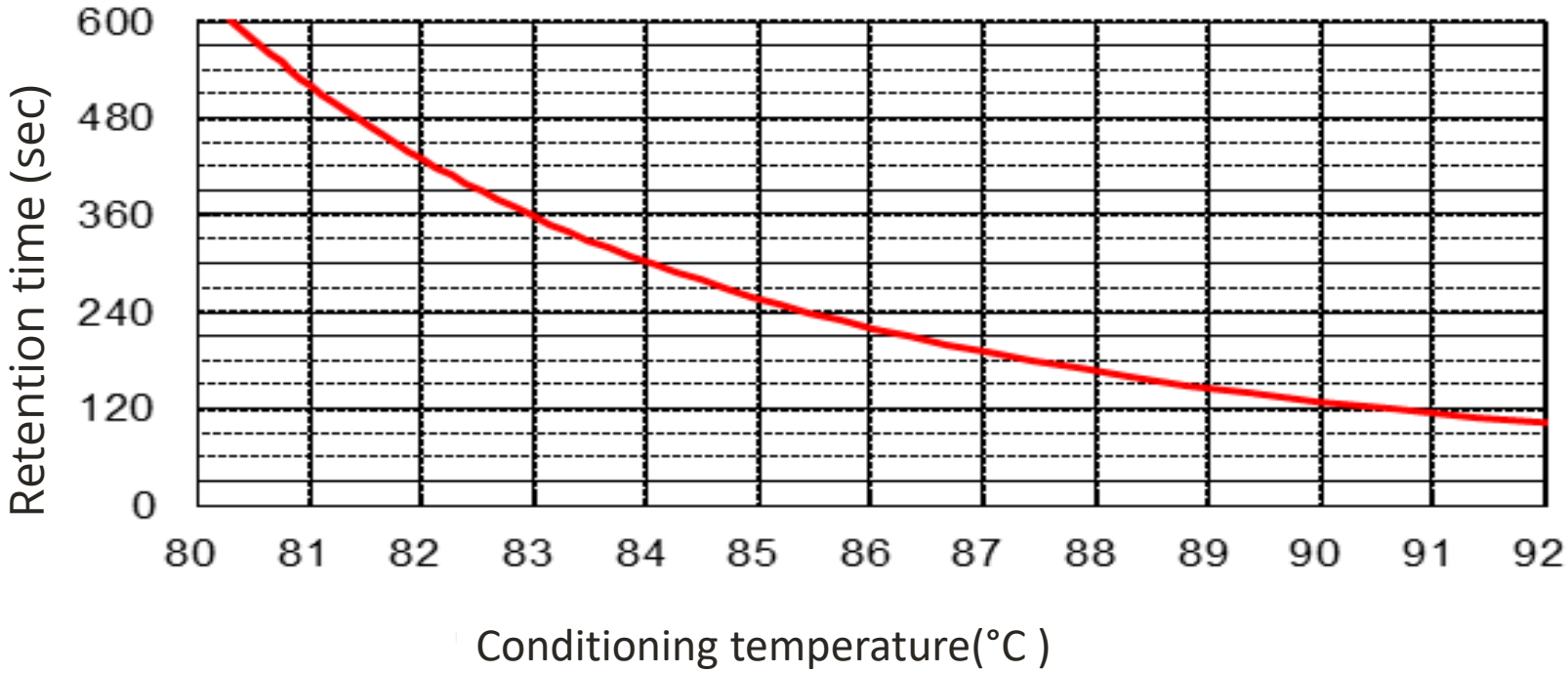
Pathogen reduction (Salmonella control)

Nutrient retention vs. overprocessing

Latest tech: hygienisers, thermal conditioners

Pathogen reduction (Salmonella control)

Retention Time vs. Temperature for 100,000:1 Salmonella Reduction at 15% Moisture



$$T(°F)=[(\log\%\,survivors - 2.00)/\log(time) - 3.9563/-0.0326$$

Dr. Hans Reimann, Avian Diseases, Fall 1995

Latest tech: hygienisers, thermal conditioners.

Future Trends

Application of alternative proteins

Re-use of excess food streams

Increasing control over specific energy input

Digitalization, Internet of things in feed processing

Artificial intelligence support

Predictive maintenance

Key Takeaways & Q&A

Optimized Feed Processing:
Advanced grinding, conditioning, and pelleting boost productivity, efficiency, and sustainability.

Animal Health & Safety:
Proper processing improves animal health and reduces pathogens like Salmonella.

Technology & Innovation:
New equipment and digital tools (IoT, AI) drive better quality and energy savings.

Sustainability:
Sustainable nutrition supports health and prosperity within Earth's safe boundaries.

Future Trends:
Alternative proteins, food stream reuse, and predictive maintenance are shaping the industry.

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