Marie Šístkova

Martin Pšenka

Vladimír Kaplan

Jiří Potěšil

Jiří Černín

CASEE
Central and South Eastern Europe

SUA Nitra

THE EFFECT OF INDIVIDUAL COMPONENTS OF TOTAL MIXED RATION (TMR) ON PRECISION DOSING TO MIXER FEEDER WAGONS

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THE EFFECT OF INDIVIDUAL COMPONENTS OF TOTAL MIXED RATION (TMR) ON PRECISION DOSING TO MIXER FEEDER WAGONS

- INTRODUCTION
- AIM OF RESEARCH
- MATERIAL AND METHODS
- RESULTS AND DISCUSSION
- CONCLUSION

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INTRODUCTION

- Nutrition of cattle **»** quality of meat and milk;

- TMR - currently most used in the nutrition of dairy cows:
    - improves digestibility, palatability and labor-saving,
    - dairy cows are receiving destined ratio of the core and coarse fodder, including macro and micro elements and vitamins mixed together,
    - optimally solves the physiological needs of a cow and rumen microflora.

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- three types of TMR:
    - theoretical – calculated,
    - that leaves the mixer feeder wagon,
    - that animal actually receive.

- preparing TMR – **Mixer feeder wagons**

- different types and models:

Figure 1 Triolet MFW: with horizontal auger, vertical auger and self-propelled MFW

Types of mixing augers:

Figure 2 Horizontal auger

Figure 3 Vertical auger

AIM OF RESEARCH

- determine the loading precision of TMR components into mixer feeder wagon depending on their individual types and ways of management

MATERIAL AND METHODS

- Monitored mixer feeder wagons

Figure 4 Storti Labrador 120

Figure 5 Černin C 11

Mixer feeder wagon filling

Figure 3 Storti Labrador 120 – loading cutter

Figure 4 Černin C 11 – loading
by loader JCB 524-50

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- Both MFW were equipped with three point electronic tensometric scales and a responder for data transfer to PC

Figure 6 Responder for data transfer to PC
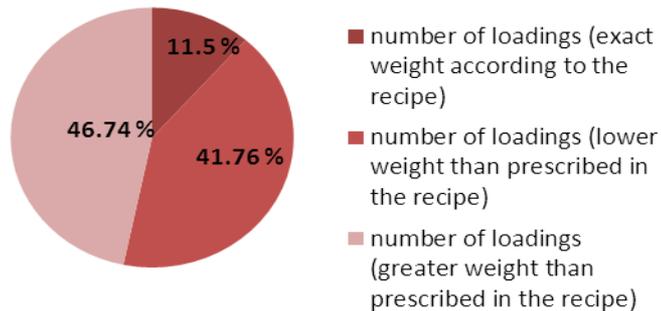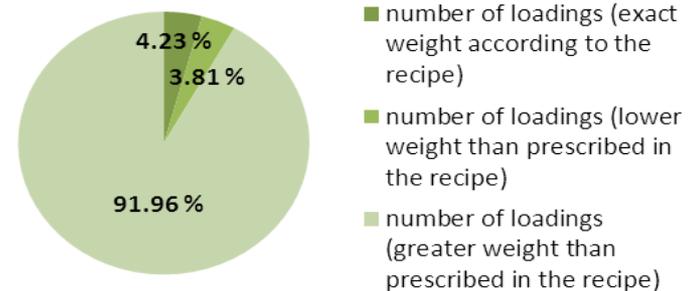
RESULTS AND DISCUSSION

Figure 7 Number of accurate, under-limit and over-limit loadings into feeder mixer wagon Labrador 120

Figure 8 Number of accurate, under-limit and over-limit loadings into feeder mixer wagon Cernin C11
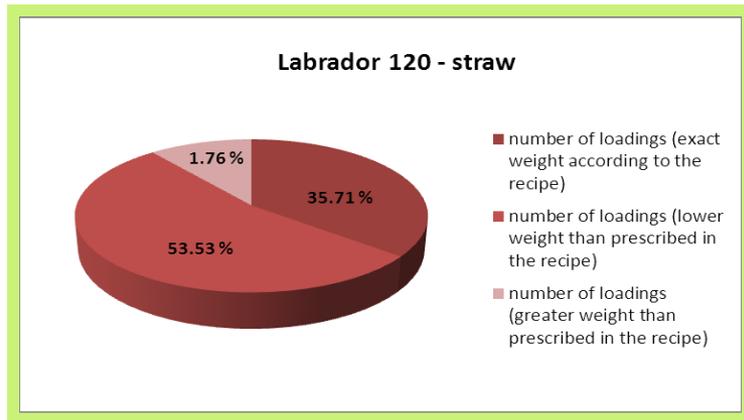
Straw

Labrador 120 - straw

- 1.76 %
- 35.71 %
- 53.53 %

■ number of loadings (exact weight according to the recipe)
■ number of loadings (lower weight than prescribed in the recipe)
■ number of loadings (greater weight than prescribed in the recipe)

Cernin C11 - straw

- 15.79 %
- 9.02 %
- 75.19 %

■ number of loadings (exact weight according to the recipe)
■ number of loadings (lower weight than prescribed in the recipe)
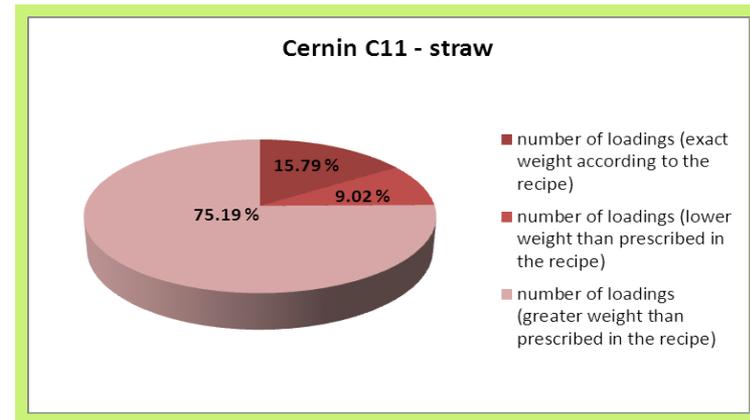■ number of loadings (greater weight than prescribed in the recipe)

Figure 9 Number of accurate, under-limit and over-limit loadings of straw with loading cutter

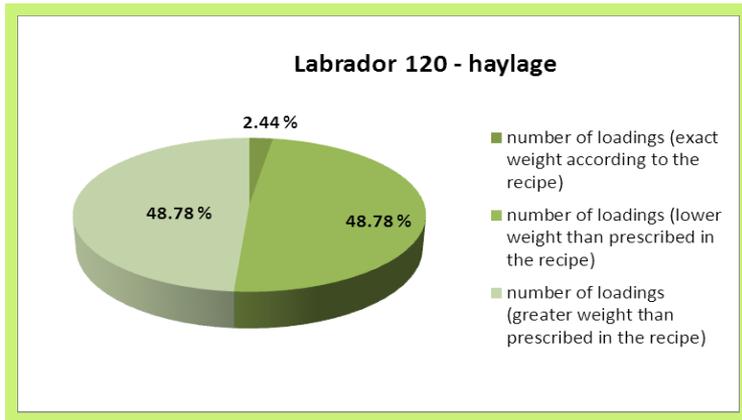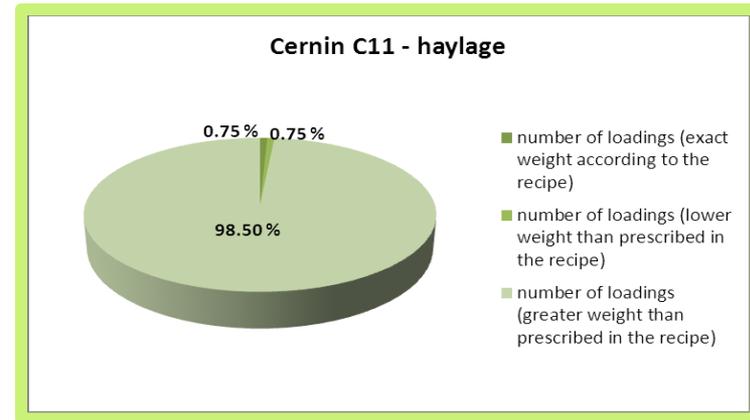**Figure 10** Number of accurate, under-limit and over-limit loadings of straw with loader

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Haylage

Figure 11 Number of accurate, under-limit and over-limit loadings of haylage with loading cutter

Figure 12 Number of accurate, under-limit and over-limit loadings of haylage with loader
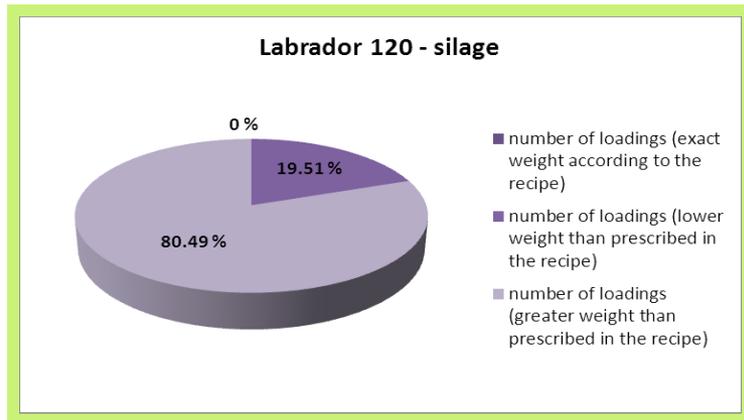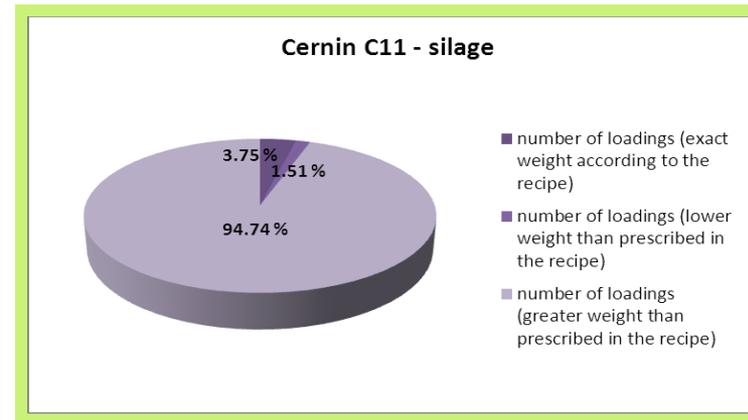
Silage

Labrador 120 - silage

- 0 %
- 19.51 %
- 80.49 %

■ number of loadings (exact weight according to the recipe)

■ number of loadings (lower weight than prescribed in the recipe)

■ number of loadings (greater weight than prescribed in the recipe)

Cernin C11 - silage

- 3.75 %
- 1.51 %
- 94.74 %

■ number of loadings (exact weight according to the recipe)

■ number of loadings (lower weight than prescribed in the recipe)

■ number of loadings (greater weight than prescribed in the recipe)

Figure 13 Number of accurate, under-limit and over-limit loadings of silage with loading cutter

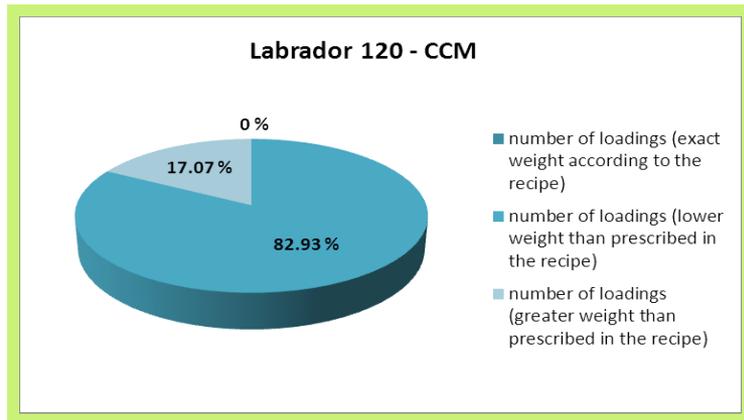**Figure 14** Number of accurate, under-limit and over-limit loadings of silage with loader

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CCM (corn cob mix)

Labrador 120 - CCM

- 0 %
- 17.07 %
- 82.93 %

■ number of loadings (exact weight according to the recipe)
■ number of loadings (lower weight than prescribed in the recipe)
■ number of loadings (greater weight than prescribed in the recipe)

Figure 15 Number of accurate, under-limit and over-limit loadings of CCM with loading cutter

Cernin C11 - CCM

- 3.01 %
- 5.26 %
- 91.73 %

■ number of loadings (exact weight according to the recipe)
■ number of loadings (lower weight than prescribed in the recipe)
■ number of loadings (greater weight than prescribed in the recipe)
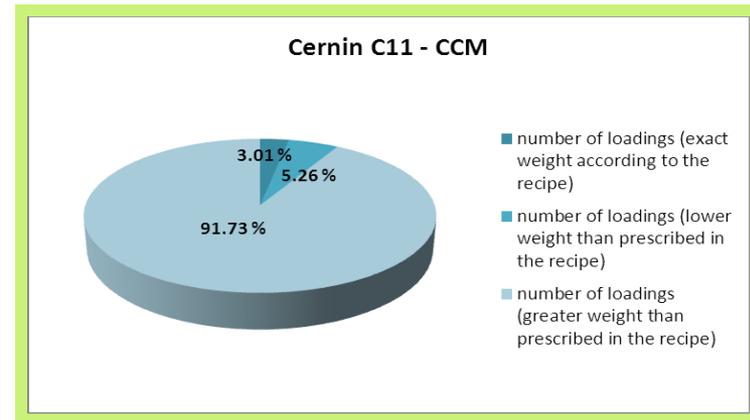
Figure 16 Number of accurate, under-limit and over-limit loadings of CCM with loader

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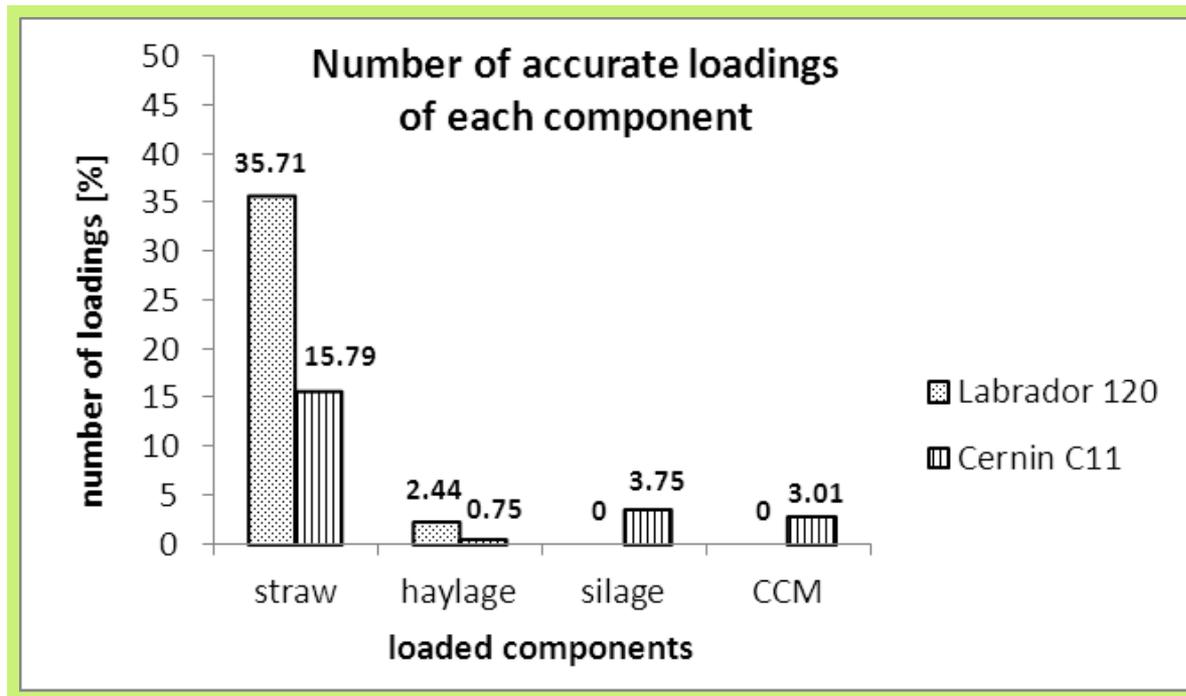
Accurate loadings of each component

Figure 17 Number of accurate loadings of each component by loading with loading cutter (Labrador 120) and loader (Cernin C11)

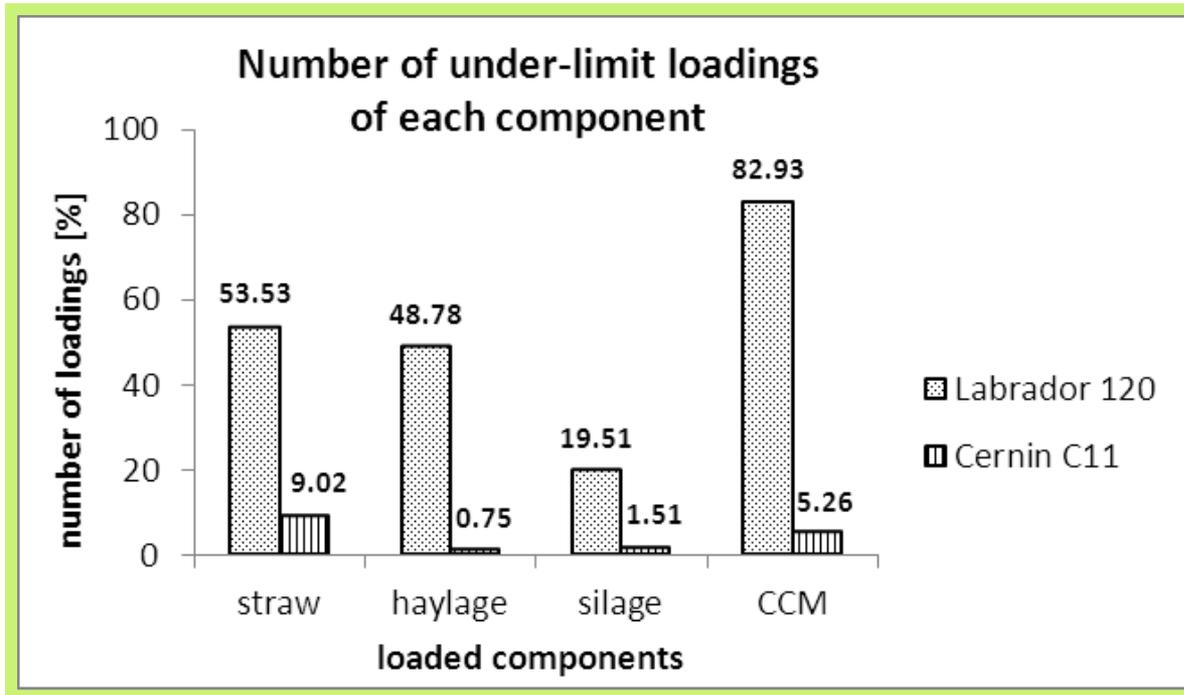# Under-limit loadings of each component

Figure 18 Number of under-limit loadings of each component by loading with loading cutter (Labrador 120) and loader (Cernin C11)

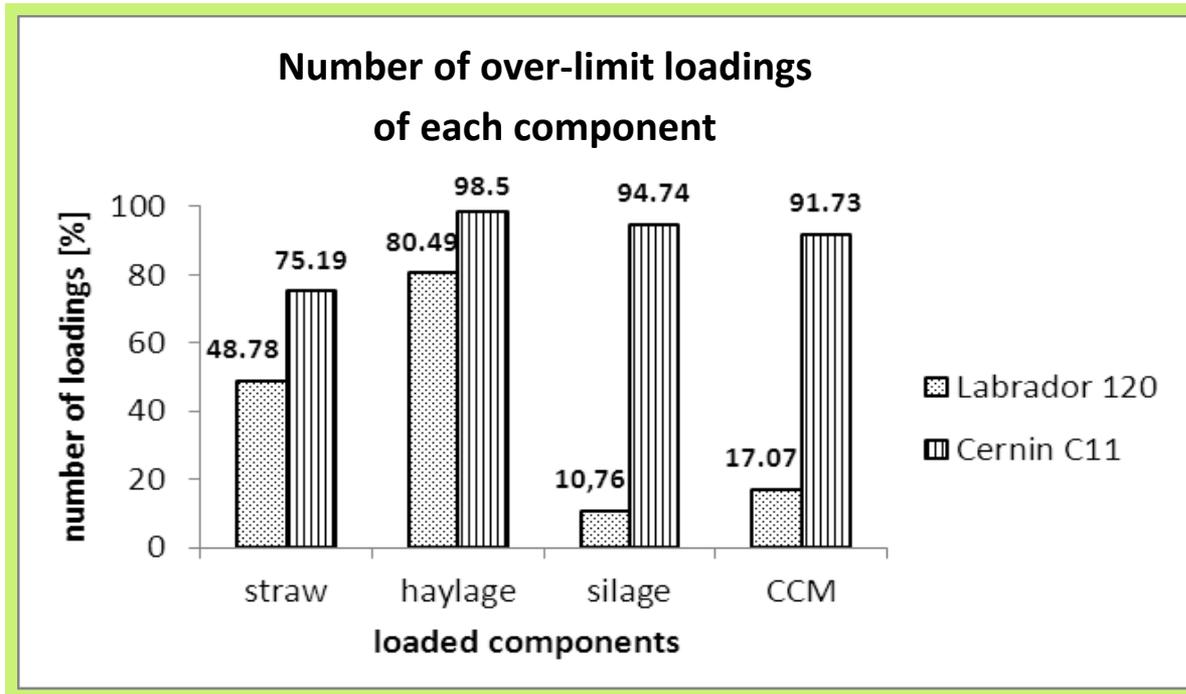# Over-limit loadings of each component

Figure 19 Number of over-limit loadings of each component by loading with loading cutter (Labrador 120) and loader (Cernin C11)
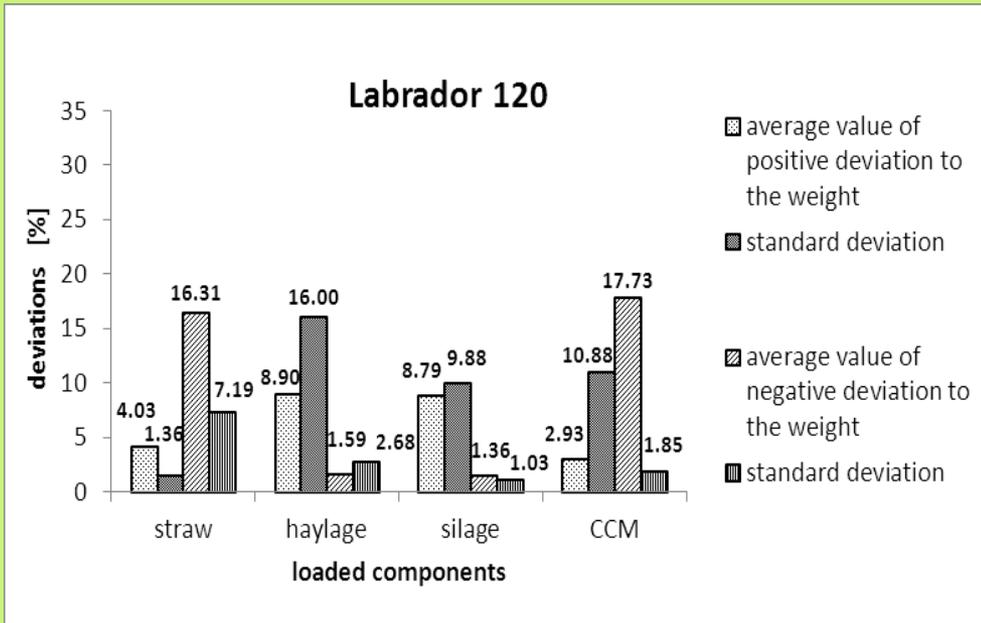
Figure 20 Average values of weight deviations and standard deviations by each component when loading with loading cutter (Labrador 120)
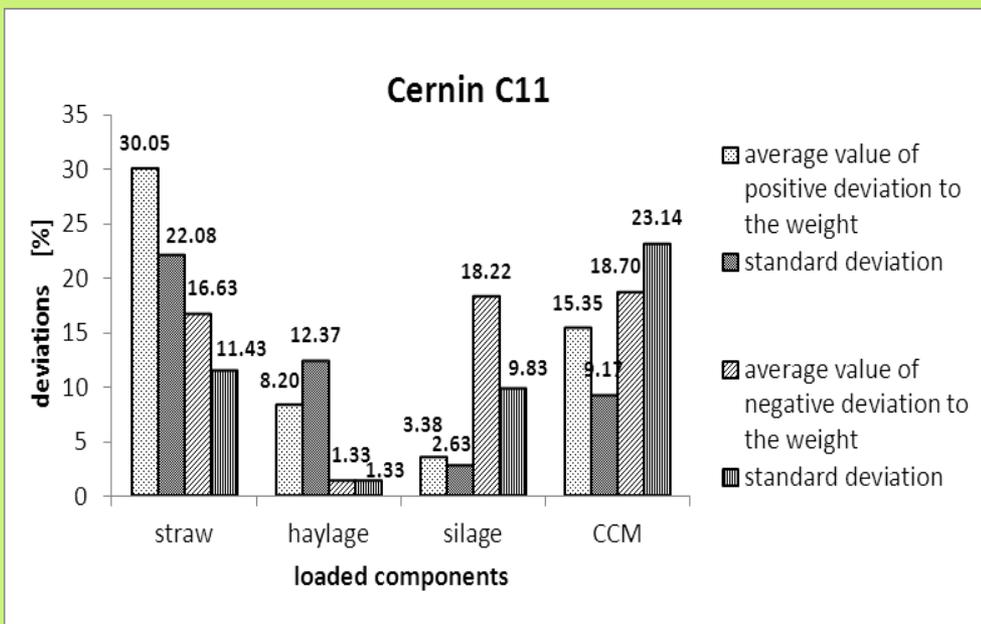

Figure 21 Average values of weight deviations and standard deviations by each component when loading with loader (Cernin C11)
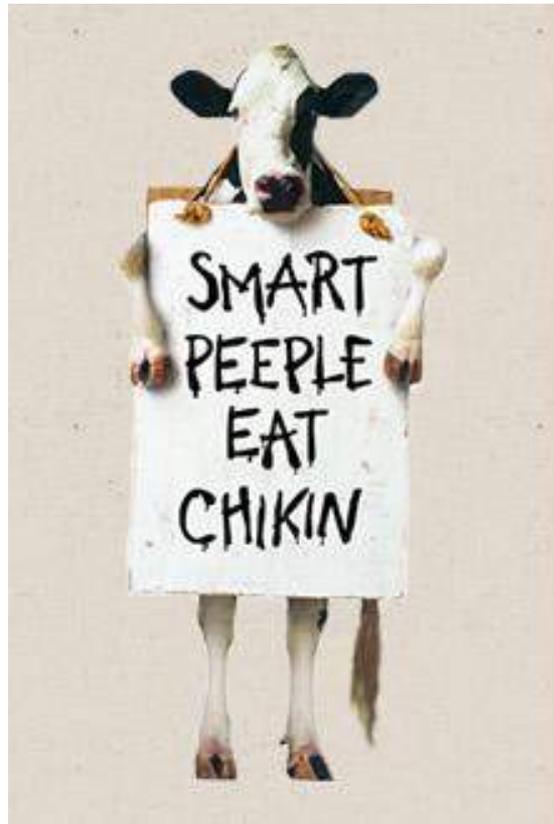
Figure 22 Dairy feeding

CONCLUSION

- the precision of **loading of the individual components** into the mixer feeder wagon **depends** not only **on the method** (used technique), but also **on the kind of properties of loaded components**

- **dry components with low cohesion** (straw**) are loaded more accurately** and **components with lower humidity and greater cohesion** (hay) **are** already **loaded less accurately with a predominance of loadings above the limit for both types of loading**

- **for components with higher humidity** (silage, CCM) **is the number of accurate loadings low** (loading with loader) or zero (loading by loading cutter). The number of over-limit loadings is high in loading with loader, in loading with loading cutter, prevalent in these components rather number of with under-limit loadings. **Loading with loading cutter is considerably more even than with the loader.**

THANK YOU FOR YOUR ATTENTION