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Comparison of traditional and modern horse implement usage in farming

S u m m a r y

The aim of the study was to compare the resistance, speed of movement and work efficiency between traditional and modern horse agricultural implements. The traditional implements were as follows: single plough, double-furrow plough, spike-tooth harrow and spring-tooth harrow. Ploughs with a seat for the driver and fore-cart for harrowing were the modern implements used in the study. One warmblood mare, one pair of warmblood mares, one pair of coldblood mares and four Felin Pony mares were harnessed one by one to those implements. The fatigue level in the horses and the drivers was determined with the heart rate during the work. The modern implements increase considerably the resistance by their higher mass and the mass of the driver. This influences the speed and efficiency of work. American cart-plough increases the resistance twice as compared

to single plough managed on foot. Polish double-furrow plough with the seat came out to be more effective, since its resistance is similar to the sulky-plough but the efficiency of the pair of horses pulling it is higher by 25%. The fore-cart used for harrowing improves considerably the conditions of work for the driver, who does not follow the harrow and is out of the dust zone. The efficiency of the fore-cart connected with the harrow is lower compared to the harrow driven on foot: by $\frac{1}{3}$ in case of one mare and $\frac{1}{5}$ in the case of warmblood mares. It is concluded that the fore-cart with the harrow should be pulled by two or three horses. The higher effort is shown by the increased heart rate in all the horses studied. This decreases the daily efficiency. When the horses are accustomed to the work, the daily efficiency is higher. The heart rate is lower in the persons driving from the seat compared to those driving on foot.