PREDICTED SELECTION RESPONSE FOR PRODUCTIVE AND REPRODUCTIVE
TR AIDS IN MACEDONIAN NATIONAL BREEDING PROGRAM

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INTRODUCTION
Swine production in Republic of Macedonia has big significance, because pork has greater importance in human diet as a final product or processed pork products. Increased consumption of pork in last decades contributed in intensification of development in pig breeding and import of pure and hybrid pigs. Demands for pork for consumption as fresh meat and industrial processed products are approximately 20.100 t per year. For this amount of meat, annually it is necessary to have production of 300.000 finishing pigs. In the past period pig farms were been forced to conduct their own old methods for breeding and selection with minor effects. They were closed populations with autonomic system of artificial insemination. The basic goal of proposed pig-breeding program was to offer solutions for increasing the level of genetic progress in pig breeding and improvement of economic important traits of pigs for achieving the optimal economic effects. Proposed breeding program finally defined: formation of breeding pyramid, choice of breeds, selection directions and methods of breeding, identification, recording, control, evaluation of breeding program and ranking of animals, selection of animals and use of selected animals in reproduction.

MATERIAL AND METHODS
Estimated number of 18.530 sows in national population is been optimized in the way that will allow planed size of production of 300.000 finishing pigs per year and create possibilities for accurate selection. This number is been estimated based on present production conditions, biological limits, time like a factor and basic selection parameters. Method of replacement of parents and percentage of selected animals were limiting factors, after finished performance test and reproductive check. Anticipated period for accomplishment of program on all levels of breeding pyramid was ten years. Breeding program anticipates two selection directions in four pure breed lines (11, 22, 33 and 44) and three lines of crossbreeds (12, 21 and 43). Paths of selection are sire - son, dam - son, sire - daughter and dam – daughter and selection directions are: selection for improving of reproductive traits and selection for improving of productive traits. Aggregate breeding values, summarized in three indexes is planned for use for making of decisions in the selection as follows economic indexes:

**Index of dam (ID)**
- number born alive piglets, 21 litter weight, days to 100 kg body weight, backfat thickness at 100 kg body weigh,

**Dam productivity index (DPI)**
- number born alive piglets and 21 litter weight and

**Index of sire (IS)**
- days to 100 kg body weight and backfat thickness at 100 kg body weigh.

Optimization of effective population size and the other factors important for the success of breeding program was performed based on large number of simulations. During the simulation of effects from proposed selection method, appropriate input parameter chosen based on
theoretical accepted values, were been used. Simulations were generated and analyzed using GENUP program (Kinghorn, 1997).

RESULTS AND DISCUSSION
In the selected directions, where the ratio male: female is 1:20 and with replacement of both sexes in reproduction in the first year and culling of boars in the second and sows in the third year, expected results are: generation interval in boars and sows to be 1.47 and 1.93 respectively and selection intensity in boars and sows to be 2.018, and 0.387 respectively. If the single trait selection is been made, than the following annual effects are expected: 2.75 days decrease of number of days to 100 kg live weight, decrease of backfat thickness for 0.072 mm, increase of number born alive piglets in litter for 0.18 and increase of litter weight at 21st day for 0.77 kg. In simultaneous selection on more traits (multi-trait selection) if used for seven years, simulation conducted with use of ID, that includes BLUP evaluations for four traits, resulted in significant selection response in the selection of nucleus herd. (Figure 1.). Simulation performed on the basis of SI, that includes BLUP estimation for both productive traits, also revealed that, selection for seven years could resulted in significant genetic improvement in nucleus herd (Figure 2.).

Figure 1. Predicted response in the selection in nucleus if used ID
CONCLUSION
For successful prediction of efficiency of proposed selection for productive and reproductive traits according proposed breeding program is urgent estimation of true phenotypic and genotypic parameters and respected economical weights for selected traits. Those results need to be chosen like appropriate input parameters for following simulations and correction of starting positions in Macedonian National Breeding Program.

REFERENCES