GET READY FOR WORK:
PHYSICAL CONDITIONING AND INJURY PREVENTION FOR WORKING DOGS
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To obtain optimal performance from working and sporting dogs, they must be properly conditioned, highly trained, and free of conditions that might impede performance. The best program addresses specific needs of the dog: training, health care, nutrition, and exercise. These needs are largely met through stringent behavioral training and preventive health care plans. The aspect of the overall performance program that often remains underdeveloped is the conditioning of working dogs as performance athletes. The overall conditioning plan is simple in concept: maximize the working dog’s physical potential to make that dog prepared and conditioned to best carry out the expected duty.
Numerous factors play a role in achieving peak performance of the canine athlete. External factors such as environmental working/housing conditions, functional demands of the job and handler-dog interactions/bond can greatly influence peak performance. More pertinent to the medical discussion of maximal performance are internal factors such as anatomy, physiology and psychology. Anatomic/genetic factors are essentially pre-determined at the clinical level, as certain breeds and working drive types are selected during the consignment process. As medical caretakers, however, it is important to remain vigilant for conditions such as fatigue, pain and burn-out, along with handler stress and fatigue (particularly in crisis situations) that can seriously impede and endanger performance.
oxygen demands of exercise are then met by increases in blood flow, hematocrit, oxygen extraction from hemoglobin and to a smaller degree, from myoglobin release of oxygen. Cardiovascular and respiratory adaptations during exercise ensure delivery of the oxygen supply and nutrients needed for muscular activity and allow for the elimination of metabolic wastes. Endurance conditioning results in a significant increase in heart volume and systolic output, with a lower heart rate and myocardial stress. Although cardiac conditioning can be significant, pulmonary ventilation is nearly unchanged by conditioning with the exception of a slight decrease in respiratory rate as a result of improved overall ventilation. Pulmonary disease, on the other hand, can have profound detrimental effects on exercise capabilities and oxygenation capacities.
The concept of maximum aerobic power is important to understand for the canine athlete. This is defined as maximum oxygen consumption (VO2 max) during muscular activity at sea level, and reflects the maximum possible contribution of aerobic energy (produced in dogs by lipid oxidation) per unit of time and the functional capacity of circulation (strong correlation between maximum cardiac output and maximum aerobic power). During prolonged exercise requirements, a strong correlation is observed between VO2 max and the amount of work produced. Maximal aerobic capacity can be significantly increased through endurance conditioning programs: an untrained house dog has a VO2 max (expressed as ml/min/kg) of 60–80, whereas a highly trained sled dog may have a VO2 max of 150–180. Additionally, when training is focused on endurance, a gradual deviation in metabolic function toward improved lipid oxidation is observed. A well-trained dog digests his food better and more efficiently utilizes dietary fat for energy production. This would allow the working dog to efficiently utilize the high fat content provided by the standard feeding diet. A final noteworthy effect of increased conditioning is a less dramatic elevation of body temperature during exercise. Much of the energy broken down during physical effort is lost as thermal heat that accumulates in the body. As an illustration, the overall energy output of an untrained dog is less than 17%, with 83% of the metabolic energy lost as heat which causes a significant rise in body temperature. With physical training, energy output can be increased to 25–27%, with less metabolic energy lost as heat and less rise in core body temperature. This can actually be tracked in the conditioning program of the dog by performing standard exercises repeated at regular intervals and taking the rectal temperature before and after exercise. As the dog's physical capacity improves, the body temperature differential should decrease. This is a very important concept in working dog heat stress management, underscoring the necessity for adequate conditioning programs as a tool for minimizing heat injuries in the dogs.
Serious physical conditioning involves a planned schedule of exercises suited for the dog and the job requirements. The first step is to analyze the specific needs of the duty and identify any special medical management issues for a given working dog. Depending on these factors, the type of conditioning exercises must then be selected, and the respective needs of strength versus endurance training must be determined. The majority of working dogs are best trained through a balanced program of aerobic conditioning, strength training, and flexibility exercises. The goal for strength exercises is to load the muscles for a controlled period of time, with a set number of repetitions. Because dogs are unable to lift weights, so to speak, their own body mass must be used in exertional positions intended to target and build muscle groups. Aerobic fitness can be increased through endurance conditioning programs, and increased endurance is key in allowing a working dog to maintain a high level of performance for an extended period of time. Fast-burst, sprint-focused training may be necessary for certain dog teams such as Schutzhund performance dogs, and additional endurance emphasis may be required for dog teams such as long-distance trackers and wilderness search and rescue dogs.
Several key points must be emphasized in the design and implementation of a conditioning program for working dogs. Programs should be started slowly - many working dogs are actually in less than optimal physical shape and intense conditioning programs will only serve to produce a painful or, more seriously, an injured dog. Trainers must consider the ergonomics of any activity they are proposing for the dog – will the mechanics of that activity or repetitiveness of the activity lead to injury or exacerbate underlying weaknesses? Dogs must also be monitored very closely for overheating and declining status during training periods. In designing a fitness program, trainers, handlers, and veterinary personnel must work together to assess the capabilities and potential limitations of individual dogs.
References