ANNUAL TRAINING PERIODISATION AND ENERGY SYSTEM DEVELOPMENT FOR DISTANCE RUNNERS IN UZBEKISTAN

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Abstract. Annual planning for distance runners in Uzbekistan should integrate event-specific physiological demands with seasonal heat exposure. This paper proposes a climate-responsive training model based on a focused narrative review of endurance physiology, heat adaptation, tapering and load monitoring. The model uses an October-to-September planning year for an illustrative spring competition priority, followed by heat-managed summer training and a possible autumn competition block. Training decisions combine aerobic development, appropriately dosed high-intensity work, recovery and individual responses. The principal contribution is a coherent annual framework linking environmental conditions to training objectives. Its effectiveness requires prospective evaluation in runners with defined competitive schedules.

Introduction. Uzbekistan's continental climate includes long, hot summers and substantial geographical variation [1]. Annual training therefore requires local adjustment rather than direct transfer of a calendar developed for another setting. The planning problem is to coordinate aerobic preparation, event-specific intensity and recovery with the target competition dates and the conditions at the actual training site.

Performance in the 5,000 m, 10,000 m and marathon depends on interacting physiological characteristics, including maximal oxygen uptake (VO_2max), the sustainable fraction of aerobic capacity and running economy [2]. These events share an aerobic foundation but require different amounts of high-intensity work, prolonged continuous running and competition-specific preparation. A single set of training percentages cannot adequately describe all three events.

Aim

To develop a theoretically grounded annual training framework that coordinates energy system development, seasonal conditions and individual load regulation for distance runners training in Uzbekistan.

Methods

A focused narrative review of endurance physiology, climatic context, heat management, tapering and load assessment informed an illustrative annual model. The proposed calendar prioritises April–May competitions and allows an autumn block. Its application requires adjustment to the athlete's event, training history, local conditions and confirmed race calendar.

Results and Discussion

Physiological basis

VO_2max reflects the integrated capacity to transport and use oxygen, while running economy describes the oxygen or energy cost of a given submaximal speed [2]. The lactate threshold is a protocol-dependent marker derived from blood lactate responses to increasing workload. Lactate accumulation reflects the balance between its appearance and removal; it does not identify a complete switch to oxygen-free metabolism [3]. Oxidative, glycolytic and phosphagen pathways contribute concurrently, with their relative contributions changing as exercise intensity and duration change.

The proposed training approach combines predominantly easy running with individually prescribed threshold work, aerobic intervals and short accelerations. Exercise duration, repetitions and recovery should match the intended adaptation. Event-specific running is introduced progressively, with marathon preparation placing greater emphasis on prolonged race-pace tolerance and the shorter distance events requiring relatively more high-intensity running. Session quality and subsequent recovery determine progression.

Proposed annual training model

Table 1 organises an October-to-September planning year around the stated spring competition priority. October is a possible starting point for reconditioning, not an established optimum for every runner. Calendar windows must be revised for winter conditions, regional climate, training location and changes in competition dates.

Table 1. Illustrative annual model with a spring competition priority

Window	Phase	Training emphasis
October	Recovery and reconditioning	Recover from the preceding season; restore regular easy running, mobility and general strength.
November –January	General preparation	Build sustainable aerobic volume progressively; maintain strength, running technique and controlled short accelerations.
February–March	Event-specific preparation	Increase the specificity of threshold, interval and race-pace work; adjust repetition duration and recovery to the event.

April–May	Priority competition block	Taper before the target race, maintain selected quality work and allow recovery between competitions.
June–August	Heat-managed training	Adjust workload and session timing to thermal conditions; maintain aerobic fitness or rebuild towards an autumn target.
September	Secondary competition or reassessment	Compete if planned, evaluate the annual response and prepare the next recovery and reconditioning phase.

Heat management and tapering

Before training or competing in substantially hotter conditions, repeated exercise–heat exposure over approximately 1–2 weeks can support acclimatisation [4]. The training load should be adjusted during this period. Scheduling demanding sessions in cooler hours, arranging shade and cooling, and individualising hydration are practical options. Athletes should begin adequately hydrated and use a fluid strategy suited to expected losses and exercise duration. Environmental assessment should consider humidity, solar radiation and air movement as well as air temperature. Where available, wet-bulb globe temperature can inform heat-risk decisions. Pace, heart rate and perceived exertion should be interpreted together because heat can increase strain at an unchanged running speed.

Before a priority competition, reduce accumulated fatigue by lowering training volume while retaining appropriately dosed intensity and, where tolerated, normal training frequency. Evidence supports an approximately two-week taper as a useful starting framework, with individual adjustment [5]. Easy aerobic running and selected event-specific work remain part of the programme as total volume is reduced.

Individual load regulation

Daily records should include running duration and distance, the content of demanding sessions, recovery intervals, environmental conditions and the athlete's response. Session rating of perceived exertion provides a practical internal-load measure: a global 0–10 rating obtained about 30 minutes after the session is multiplied by session duration in minutes [6]. The resulting arbitrary units are most useful for tracking the same athlete over time.

Training decisions should also consider sleep, soreness, running technique and recovery. Repeated deterioration in these indicators warrants a workload adjustment. Interval sessions naturally combine warm-up, faster running and recovery activity. Their organisation should account for the cumulative stress of high-intensity efforts and the recovery needed before the next demanding session. Progression should follow the athlete's response.

Conclusion

An October-start model can provide a coherent planning framework for distance runners in Uzbekistan who prioritise spring competitions. Its practical value lies in linking the competition calendar, aerobic and event-specific development, heat acclimatisation, tapering and individual monitoring. The proposed sequence should

be adapted to regional conditions and event demands. Prospective comparison with usual planning is required to determine its effects on performance, training tolerance and heat-related strain; superiority of the proposed calendar has not been demonstrated.

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